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SEPTEMBER 1947

VOLUME 17 NUMBER 9

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

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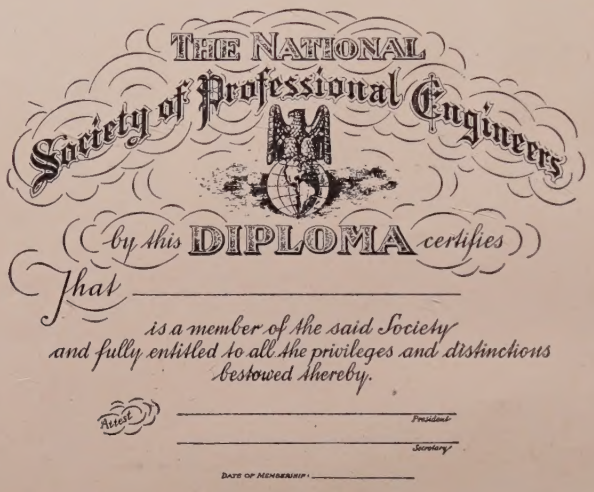

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THE AMERICAN ENGINEER

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SEPTEMBER, 1947

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EDITORIAL

Progress for Younger Engineers

The development of a full fledged professional engineer is like the metamorphosis from larva through chrysalis into a beautiful butterfly in that it takes place in stages.

These stages should be (1) development of professional consciousness through the teaching of suitable concepts and ideals in all college curricula, (2) a transition of this professional consciousness into a mature sense of professional stature through the engineer-in-training period and (3) the full blossoming of the engineer into a registered and practicing professional engineer.

Unfortunately, the lines of development are not this well defined. Individual engineers acquire their professional frames of mind at varying stages in their development. Some few may even go through these stages during college training. Unfortunately, many do not reach professional maturity until after considerable buffeting around in the practice of engineering.

State of Mind

Professionalism in engineering, as in law or medicine, is a state of mind. It is the desire to do a job well and in a dignified manner. It is a feeling of pride in one's work and an attitude which assures fair and equitable relationships with the public and with other engineers. It is the desire to improve one's self and the arts with which one deals. It is a realization that there is more to engineering than mere technical knowledge.

NSPE has pledged to promote those activities designed to make engineering a better profession, to raise the standards of practice, to create a professional consciousness and to better serve the public.

The recent NSPE Board of Directors meeting in Washington made official this tacit recognition on the part of many Society members by adopting the report of the special committee created to study the proposals of special groups of younger engineers. With respect to engineers-in-training, this report recommends that NSPE:

1. Ask all State Societies to promote legal certification of engineers-in-training.
2. Recommend to all State Societies that have not already done so that they make provisions in their constitutions and by-laws for acceptance of registered engineers-in-training as associate members or affiliates and promote their active participation in Society affairs, particularly at the chapter level.
3. Instruct its Committee on Constitution and By-Laws to consider amendments w would make it possible for certified engin in-training to become affiliated with the tional Society.

This new official policy leaves much work NSPE and its member state groups. While m states now legally recognize engineers-in-trai some do not, and the intent of the NSPE Boar Directors cannot become fully effective until e state has amended its law to provide for the recognition of this group.

A Step in Right Direction

However, the Board's action represents a st the direction of assigning to the engineer-in-t ing the importance which is his due. Time make it fully effective.

The Board also took cognizance of the import of student engineers by agreeing to "recomm to all State Societies and also to the Nat Council of State Boards of Engineering Exam and the American Society for Engineering Ed tion the effective promotion of professional cepts and ideals throughout the entire cours all engineering institutes and colleges."

This too is a step in the right direction. It recognition that professionalism is a state of and should be instilled in the student enginee is a step to overcome the criticism which has leveled at our engineering schools by their graduates who have felt handicapped in the velopment of professional concepts and idea

Both of these Board actions bring at last full and official recognition of the importanc younger men to the profession as a whole. are an acknowledgement that the future of professional movement rests with newcomer the field of engineering. They face the fact professionalism is a state of mind — that naturally develop it but that others need he attaining it.

The Role of NSPE

The plan was well thought out and thoro considered. It contains the seeds which will e ually permit the orderly development of engi along professional lines. It will assist the dev ment of all engineers into professional men, a ing that more engineers attain the goal of pr sionalism at the same time that it permits naturally adapted to such concepts and idea develop at a rate best suited to themselves.

How soon this desirable goal will be reache pends upon today's professional engineers particularly upon today's members of NSPE.

Sure —

Engineers Help Purchasing Agents

is generally accepted that engineers play a part in the purchasing action of any manufacturing concern or public utility. The following icle, by one of the nation's outstanding purchasing agents, outlines t what that part should be and warns against some of the pitfalls ich should be avoided. Briefly, the purchasig department wants and ds the help of the engineer, but it should be made available under tain conditions and circumstances.

By RALPH O. KEEFER
General Purchasing Agent
uminum Company of America

NGINEERS are God's jour-neymen who are continuing creation." And again, "En-rs are men who can do with ollar what any darn fool can do two dollars."

ke your pick of these two tions, neither of which is orig- But the Purchasing Agent pre- the latter because it speaks his age; it touches a responsive ; it ties in with his proverbial h nature. It probably provides reason why engineers get a big out of helping the purchasing rtment in its day-to-day work, hey know that purchasing alists can assist them in keeping costs down.

Countless Ways

w does the engineer help the asing department?

countless ways which are so al that you have to stop and a bit in order to list them. almost as if someone shocked with the sudden question, "Just do you go about tieing your ." You do it everyday, but e just never stopped to think about it.

re are a few such observations come to mind.

e functions of the engineering urchasing departments are com-ntary and supplementary, and cooperation is essential if the results are to be obtained. En-rs have definite ideas and re-ments expressed in terms of gth, rigidity, toughness, hard-or other physical properties, ey have a good working know-of the various materials avail-which embrace these desired rties. However, the purchas-lepartment's training and ex-ce are required in determining of the suitable materials can be obtained most advantageously. This is especially true at the present time when it is so important to incorporate in design every possible advantage that can be derived from *intelligent purchasing.*

Checks Purchasing Department

The cooperative engineer will not definitely promise his boss unreasonably early completion of a job until he first checks with the purchasing department to find when the necessary equipment, materials or

RALPH O. KEEFER

General Purchasing Agent, Aluminum Company of America, is eminently qualified to speak about relationships between engineers and purchasing departments. As well as a leader in the purchasing field, Mr. Keefer is a registered professional engineer in Pennsylvania. He has done both engineering and purchasing during his 30 years association with the Aluminum Company.

services can be procured for that job. It is apparent that if he guesses about such deliveries, he may later find that only by *emergency purchasing* can the purchasing de-department help him meet the unreasonable completion date that he "pulled out of the air." *And emergency purchasing usually is not intelligent purchasing!* At least it costs more! (If needed rolled steel items must be bought at once from a warehouse, they will cost about 50% more than if there were time to wait for delivery direct from the mill.)

The cooperative engineer will keep himself up to date by belonging to at least one good professional society. He will read a reasonable amount of current technical literature. If he is too lazy to do this, he is very apt to rely on out-of-date hand books and reference data that he used years ago in college. No buyer can do a job of intelligent purchasing if he is asked to buy, for instance, fabricated steel tote boxes whose special design includes the use of a structural steel angle that is no longer on the revised standardization list of steel mill rollings.

Economical Purchasing

As a matter of fact, even the various standard rolled steel items bear different price extras. Cooperation with the metal buyer enables the engineer to incorporate the more economical sizes and lengths of pipe, rod, bar or structural items into his designs. This is good engineering and permits intelligent purchasing.

While discussing fabricated items, let's not forget how helpful the engineering department can be in promptly checking and approving the vendor's shop drawings, so there will be no delay in starting fabrication or production of the order. Many engineers also like to help tabulate all the data received in competitive bids, particularly on jobs that they helped to design or specify. This is assistance of the highest order, as it is a check on the P. A.'s efforts to evaluate differences in shaft sizes, power requirements, types of electric drives and speed reducers, etc. Working together like this enables the P. A. to buy the *best values,* which often means buying expensive, instead of cheaper, material or equipment.

Ruskin's Advice

A straight "Price Buyer" obviously needs little or no such help. In

fact, the mechanical job of always awarding orders to the low bidder is not Purchasing. Listen to the good advice that John Ruskin once gave to the P. A.

"It's unwise to pay too much, but it's worse to pay too little. When you pay too much, you lose a little money—that is all. When you pay too little, you sometimes lose everything because the thing you bought was incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little and getting a lot—it can't be done. If you deal with the lowest bidder, it is well to add something for the risk you run. And if you do that, you will have enough to pay for something better."

We purchasing agents have come to believe that engineering is not an exact science. In an article written a year ago, entitled "Engineers Are OK," an engineer is quoted as saying, "Engineers don't pretend to know everything about everything." The purchasing department appreciates a corollary of this principle which might be stated as follows: "No matter how complete an engineer's specifications and designs may be, they probably are not perfect." They probably will have to be changed a bit here and there, particularly after the purchasing department takes them to the market place and shows them to prospective vendors or fabricators. If the engineer is flexible, open-minded, cooperative and appreciative of efforts to help him write more practical and more economical specifications, it is a joy for both vendor and buyer to work with him. This is part of that day-to-day help from the engineers that the purchasing department appreciates so much, but which it too often accepts as a matter of course. Woe betide the buyer, however, who does not receive such cooperation from the engineer. I challenge any P. A. to do a job of intelligent buying under such a handicap.

PA and Sales Work

Each purchasing agent is in a good position to do two kinds of sales work: (1) To arouse interest in his own company's products in the minds of vendors; and (2) To sift information from the visiting salesmen and select that which might be helpful when passed on to the operating and engineering personnel. It is, of course, an open question as to how much time a P. A. should spend in the apparently extra-curricular activity of "selling" his own company people regarding the merits of some new material or piece of equipment. It is seldom right for a P. A. to let a visiting salesman merely dump numberless sets of catalogues on his lap with the request that he not only show them to all his engineers in that office, but also write to all of his company's plants at other locations, extolling the merits of this salesman's wares. Of course, if it involves an obvious "answer to a maiden's prayer" in solving troublesome difficulties of long standing, the P. A. will naturally want to spread the good word at once. Nothing will stop him!

But such happy experiences are the exception.

Normally, it suffices to call up one of the engineers and say, "Bill, can you come down and help me talk to Mr. Jones of the XYZ Equipment Company? He has something here that may be of interest to you and your gang." A cooperative response is very helpful to all concerned, and it is really fun to see how appreciative the salesman is after being given this kind of a reception. And don't you think that this might help the salesman be more receptive and cooperative when you later put in a good-natured "plug" for your own company's products? Isn't he more apt to carry the good word about your products back to his own people? Isn't that better than cold-blooded reciprocity which too often carries with it a veiled threat of coercion? (And frequently the P. A. needs his engineers' help to incorporate their own product in the item being purchased. This also is apt to require some change in the original design or spec's.)

Mutual Help

But the real point of this story is that the engineer, in helping the P. A. interview the occasional salesman on technical subjects, is of tremendous help to the purchasing department as well as to himself and to his company. Occasionally, he can help the P. A. avoid buying a "gold brick," or conversely, will see something of value that escapes the P. A.

A year or so ago, I heard a misguided P. A. say, "I'll be darned if I ever go to the engineering department and ask for advice if I can avoid it. I don't enjoy showing my ignorance!" Any garden-variety of psychologist could tell you quite accurately what is wrong with such a person, and I suspect that the words "inferiority complex" would ap somewhere in his explanation. that same psychologist could also the engineers a few helpful poin as to how to encourage such a P to overcome his reluctance to help and advice from them. A all, buyers and engineers are m bers of the same team, and they have a real responsibility to dev and foster an attitude of mutual spect and helpfulness toward other. The wise manager, or ov of a business, will keep an ey this relationship and do his pa encourage its development.

Knowledge of Business Practi

It is very helpful to the Purc ing Department if the engineer or can develop, a good comme sense of values and can acquire s knowledge of business practice. many cub engineers come to in try without this "sense" being veloped. They have no knowl or interest in the laws of econo but think only in terms of pure ence, formulae, theory, etc. Such engineers need much training be they satisfy the definition of engi quoted above. They need to po a conviction that our American petitive system of free enterpri the best for the greatest numbe our citizens. Thus they will thoughtlessly prevent fair compet by committing their employer purchase when all they intende do was to seek information an vice. But they will in fact make outside contacts through the chasing department which will forget that the time to start and open competition on a pr is at the beginning, and not way through a job when it is late. Late bids are neither fa the late bidders nor to the one did all the original ground wo

The purchasing department frequently must ask the engine department to send men to in new or scrap metal and nev second-hand equipment that is considered for rental or purc Inspection of a shop or fabric plant is often necessary to pre mine whether or not a prospe supplier, fabricator or contract competent and properly tooled a certain job efficiently. Many must also be made for inspecti work in progress, or witnessi final tests of equipment (pri shipment) at the vendors' plants. type of assistance just could n dispensed with! It is invaluab

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NSPE Nominating Committee Announces Selections for 1948

he Nominating Committee here-espectfully presents its nominees officers of the National Society Professional Engineers for the of 1948:

For President

Alex Van Praag, Jr.

of Illinois

lex Van Praag, Jr., currently PE vice-president for the Cen- Area, was born at Little Falls, nesota, January 29, 1896.

e received his BS degree in civil neering in 1917 from the Uni- ity of Illinois, after having at- ed James Millikin University High School, both in Decatur, ois.

uring World War I he served as rst Lieutenant in the U. S. Army. 1919 he was appointed assistant he office of the City Engineer, atur, and in 1920 he was made stant State Sanitary Engineer Illinois.

t present, Mr. Van Praag is a ber of the firm of Warren and Praag, Inc., consulting engi- s. He has been associated in this city for 25 years. The firm is ed in Decatur.

Varren and Van Praag, Inc., is consulting engineering firm used nany cities and villages in Illinois adjoining states, specializing in design and construction super- on of municipal public works pro- s, particularly water supply, sew- e, and light and power projects.

uring World War II Mr. Van ig was Special Assistant to the Production Board, Architect ineer for the U. S. War Depart- t in responsible charge of water ly and sewage facilities of the gamon Ordnance Plant, and Ar- ect-Engineer for the U. S. War artment in responsible charge of neering construction of Freeman y Airfield at Seymour, Ind.

e was a National Director of PE from the State of Illinois n 1942 through 1945 when he re- uished this post to assume the PE Vice-Presidency for the Cen- area, which position he still s.

r. Van Praag is a member of American Society of Civil Engi- s, the Illinois Society of Profes- al Engineers (President in 1942), a member of the American Water Works Association, and a member of the Central States Sewage Works Association.

He is a member and past president of the Decatur Illinois Lions Club, a member and Past Exalted Ruler of the Decatur Elks Club, member of the Decatur Association of Commerce and a member of the Decatur Club.

He is registered as a Professional Engineer in Illinois, Iowa and Indiana. He is also the author of numerous articles on water supply, sewerage, and light and power for various technical publications.

He has been a regular contributor to the American Engineer.

* * *

For Vice-President
Northeastern Area

William F. Ryan

of Massachusetts

William F. Ryan, Assistant Engineering Manager of Stone and Webster Engineering Corporation, Boston, is a mechanical engineer who has specialized in steam power plant and chemical plant design.

Each year the NSPE Nominating Committee selects a candidate for each office of the Society for the following year. These nominations are reported in the September American Engineer.

This year's nominating Committee is composed of J. Raymond Meehan District of Columbia) Chairman, W. H. Larkin (New York), Herbert Moore (Wisconsin), Stephen G. Szabo (Michigan), and Bruce Williams (Missouri).

He was graduated from Harvard College with an AB degree in 1911 and from the Harvard Engineering School with the degree of MME in 1913. After five years with Interborough Rapid Transit Company, where his time was about equally divided between construction and operation, and two additional years of steam plant operating experience with Wright Martin Aircraft Corporation in New Brunswick, N. J., he joined the Harry Hope Engineering Company in Boston. In this position he designed a number of steam power plants in the New England territory.

In 1924 Mr. Ryan went to Syracuse, N. Y., and for the following five years was employed by subsidiaries of Allied Chemical and Dye Corporation and during this same time designed the first super pressure industrial power plant in the United States. He was also responsible for the mechanical design of the great nitrogen fixation plant in Hopewell, Virginia.

Mr. Ryan returned to Boston in 1929 to assume a position as a mechanical engineer for the Stone and Webster Engineering Corporation where he has been responsible for the design of power plants totaling more than 1,000,000 kw. and a number of large chemical installations.

Mr. Ryan is a Fellow of ASME, which he has served in a number of official capacities, both locally and nationally. He is a Past President of the Massachusetts Society of Professional Engineers and has been National Director of the Massachusetts Society since 1945, is now President of the New England Section of the Harvard Engineering Society. He represents ASME on the ECPD Committee on Engineering Ethics, and NSPE on the EJC Committee on the Economic Status of the Engineer.

He was also chairman of the Special NSPE Committee which recently submitted its final report on Recommendations of the G. E. Engineers Association.

* * *

For Vice-President
Central Area

Lawrence Peterson

of Wisconsin

Lawrence E. Peterson was born in Sheboygan, Wisconsin, November 5, 1897.

He received his grammar and high school education in Chicago and both his BS and graduate civil engineering degrees from the University of Illinois.

In 1920 Mr. Peterson went to work for the Paul J. Kalman Company of Chicago as detailer, designer and estimator of reinforced concrete work. Two years later he joined the Building Products Com-

pany at Toledo, Ohio, and in 1923 was with the Barton-Spider-Web System in Chicago. While with this last Company, Mr. Peterson had complete charge of designing the structure of the $1,500,000 Studebaker service station in New York City.

On October 1, 1923, he went to Milwaukee to assume charge of engineering for the Milwaukee Corrugating Company, now the Milcor Steel Company. Here he had complete charge of the design, manufacture and marketing of the Milcor Steel Dome. For two years he had charge of a subsidiary company which furnished and installed steel tile on reinforced concrete buildings. In May of 1927 he helped organize and became Vice-President and Treasurer of the Osthoff-Peterson Company, Consulting Engineers, in Milwaukee. It was in this capacity that he made most of the structural designs and drawings for the new Milwaukee County Courthouse. The general supervision of this construction was also a part of his job.

In 1932 Mr. Peterson purchased this firm and changed its name to Lawrence E. Peterson, Consulting Engineer. Following his purchase, the firm was expanded to include industrial professional engineering in all of its phases. It now includes architectural services and structural, mechanical, electrical, plumbing, heating, ventilating refrigeration, air conditioning and power plant engineering. These activities have become national in scope.

Recently, Mr. Peterson changed the firm name to Lawrence Peterson and Associates,Consulting Engineers, and expanded the scope of operations still more. The new firm is equipped to handle in addition to those projects already mentioned, hotels, churches, city plannng, airports, bridges and hospitals.

Mr. Peterson is president of the Milwaukee Metropolitan Plan Association and belongs to Tau Beta Pi, Sigma Tau, and Lambda Chi Alpha fraternities.

Mr. Peterson has long been active in work of the Wisconsin Society of Professional Engineers. He was national director from Wisconsin from 1944 through 1946. He is currently chairman of the NSPE highly important membership Committee.

For Vice-President
Southern Area
Robert Coltharp
of Texas

Robert Coltharp was born at Nocona, Montague County, Texas, August 7, 1906.

He attended grammar schools at Ringgold, Margaret, and Childress, Texas. He graduated from Childress High School in 1923 with highest honors.

He received his BS in Civil Engineering from the University of Texas in June of 1927 and his MS in June of 1929.

In September of 1927 he joined the staff of John D. Miller of Austin Texas, organized Southwest Aerial Surveys and since that time has been General Manager of that Company. In this capacity he has been responsible for both office and field work and has acted as a consultant on design and development of aerial surveying equipment and methods.

Concurrently with his aerial survey work, Mr. Coltharp was Area Engineer for CWA in charge of land classification and property ownership mapping of Washington County, Texas from December 15, 1933 to March 31, 1934 and Associate Engineer of U. S. Engineering Department, Fort Peck, Montana on the land appraisal of the Fort Peck Reservoir from August 15, 1934 until September 30, 1934.

In August of 1939 Mr. Coltharp and John D. Miller organized the Texas Engineering Company, consulting engineers. In November, 1941, in conjunction with Terrell Bartlett, John A. Norris and John D. Miller, Mr. Coltharp organized the consulting engineering firm of Bartlett, Norris, Coltharp and Miller. This firm was the architect-engineering firm associated with the H. B. Zachry Company on the contract for the Air Force Navigation School, Hondo, Texas. On this $10,000,000 project, Mr. Coltharp was Administrative Engneer in complete charge of progress reporting, records, purchasing, property, payroll, accounting and stenographic sections for Bartlett, Norris, Coltharp and Miller.

On July 1, 1942 Mr. Coltharp was ordered to active duty with the Army Air Force. He served for two years in the Directorate of Photography, and one and one half years in the 311th Photo Wing as a pilot and Photo Officer. He was separated from active duty in January, 1946, as a Major in the Air Reserves.

Mr. Coltharp is a registered civil engineer in the State of Texas, associate member of the American Society of Civil Engineers, member of the American Society of Photogrammetry, member of the Texas Society of Professional Engineers and member of the Austin, Texas Rota Club.

Mr. Coltharp has a long active cord in both TSPE and NSPE. 1939 he was a member of a TSI committee to study the status of gineering in the State of Texas. has been national director of NSI on two different occasions, from 19 through 1942 and then again fr 1946 through 1947. During the terim, in 1943 and 1944 Mr. Colth served as Vice-President of the S ciety.

For Vce-President
Western Area
A. J. Shaver
of Nevada

A. J. Shaver was born at Bat Creek, Michigan, August 20, 18

He graduated from the Univers of Nevada in 1924 with a BS deg in Electrical Engineering. He ceived a Professional (advanced) gree in Electrical Engineering 1931, submitting his thesis on subject, "Upstream Storage, Truc River Basin."

In June 1924 Mr. Shaver ente the employment of the Truckee Ri Power Company as Junior Engine subsequently advancing to engine sales engineer, power engineer, praisal engineer and Business M ager.

In 1936 he transferred to Win mucca, Nevada as Manager of We ern States Utilities Company, was with this concern until 19 when he joined the Colorado Ri Commission of Nevada at Las Ve as Resident Engineer.

Mr. Shaver is President of the N vada Society of Professional En neers, a member of the Ameri Geophysical Union being active in Section on Hydrology, member Western States Snow Survey C ference, member of State Board Examiners for Nevada, member National Reclamation Associat and a member of the Advis Board of the National Rivers a Harbors Congress.

He is a past Grand Chancellor the Knights of Pythias, Past Mas of the Free and Accepted Masons member of the Las Vegas Cham of Commerce, and a Director of Las Vegas Rotary Club. He has so been active in the Boy Scouts w and in Community Chest work.

For Treasurer
Russell B. Allen
of Maryland

Russell B. Allen was born in N Haven, Connecticut, in 1901. He graduated from New Haven H

(*Continued on Page* 19)

Transition Report Shows Rapid Growth of Profession

ıe future of professionalism in ıeering is bright if a tendency rd more education can be taken n indication that more practi- rs will adopt a professional mien standards.

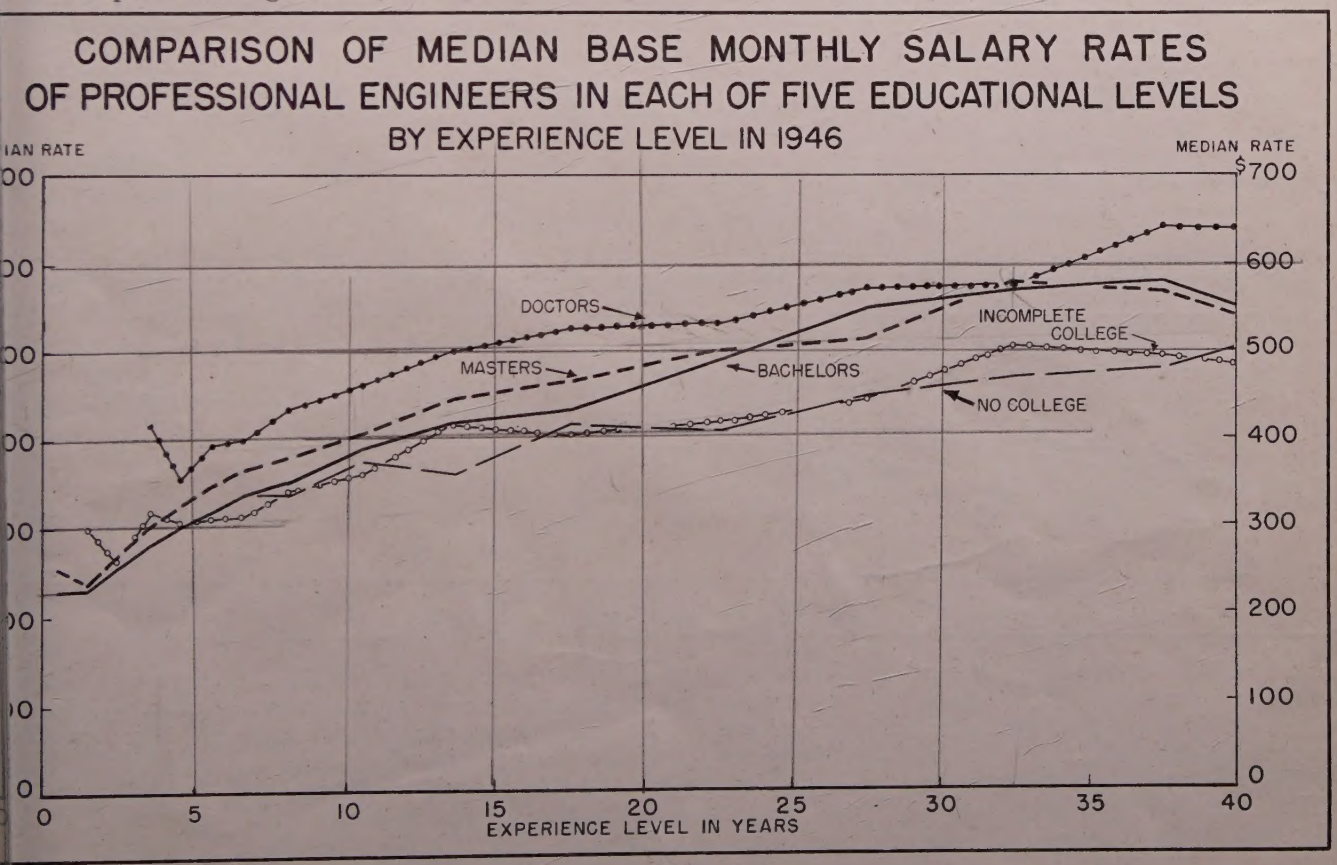
ıere is a tendency toward more ation among engineers accord- o the recently published survey ared by Andrew Frazer for the Committee on the 1946 Survey the Engineering Profession. chart page 10.) NSPE is a ber of this Committee and its bership contributed answers to questionnaire from which much was derived.

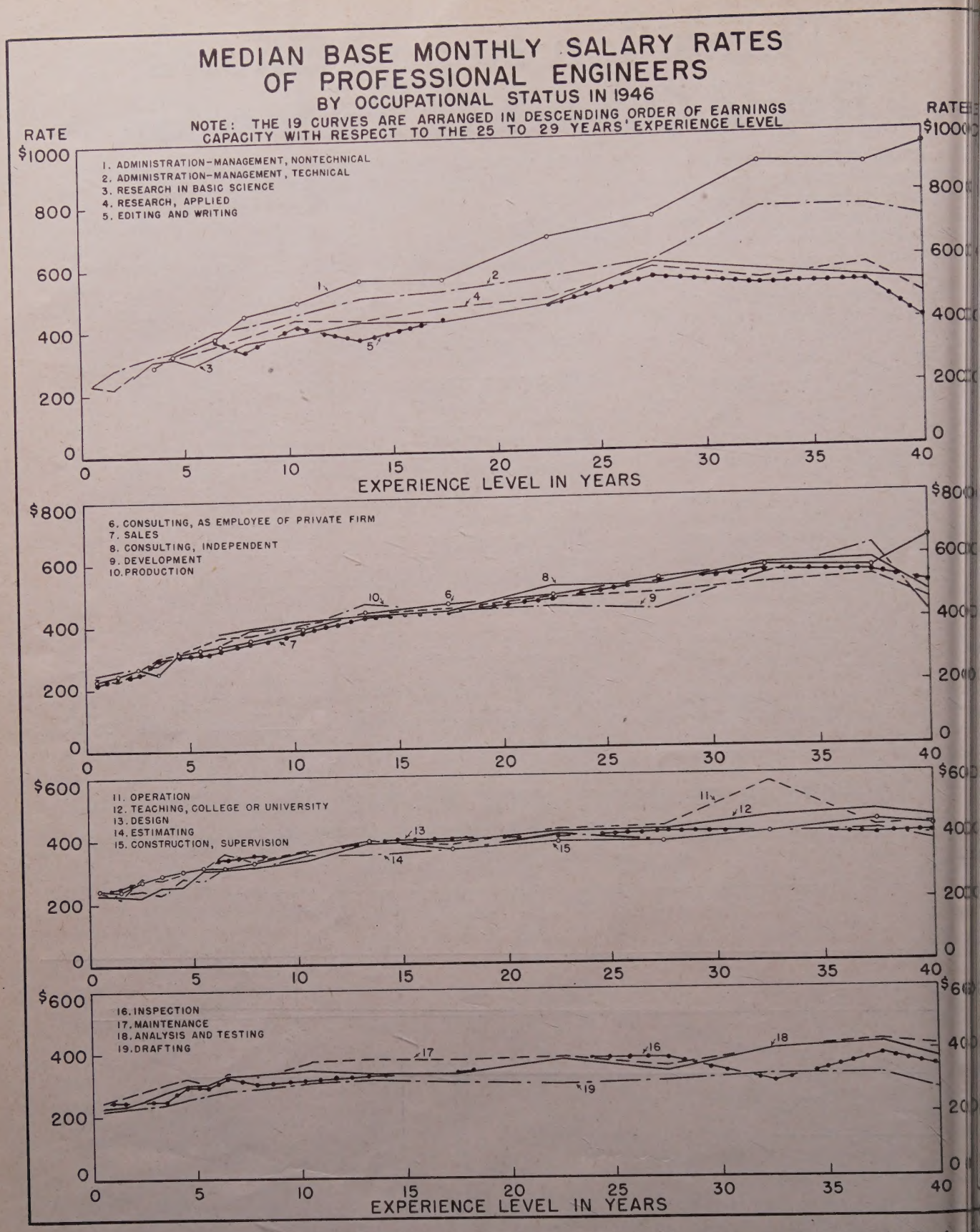
ıe study also shows that engi- s who have advanced degrees to earn larger salaries than those less education, particularly as gain experience. This is true ıgh the 20 year experience level, ugh discrepancies seem to de- after that. (See chart below). ıe report shows that as of 1930 were 72 percent graduate and ercent non-graduate engineers. he end of 1940, these propor- had changed to 78 percent grad- and 22 percent non-graduates,

PERCENTAGE DISTRIBUTION OF THE ENGINEERING PROFESSION, BY OCCUPATIONAL STATUS IN 1939, 1943, and 1946

Occupational Status	1939	1943	1946
Total in any one year	100.0	100.0	100.0
Administration-management, technical	22.6	26.6	30.4
Design	14.2	15.3	14.9
Development	5.2	7.0	6.8
Research, applied	4.9	6.0	5.8
Construction, supervision	7.6	6.3	4.7
Teaching, college or university	5.3	4.8	4.4
Consulting, as employee of private firm	3.5	3.5	4.2
Sales	4.1	2.9	4.1
Administration-management, nontechnical	2.7	3.0	3.6
Consulting, independent	2.7	2.0	3.6
Operation	4.2	3.5	2.4
Analysis and testing	3.3	3.4	2.2
Production	2.2	3.2	2.1
Any occupational status not specified	2.5	2.0	2.1
Maintenance	2.8	2.3	1.9
Drafting	3.3	1.7	1.1
Estimating	1.6	1.2	1.1
Inspection	2.2	1.8	.9
Editing and writing	.5	.6	.7
Installation	.7	.8	.6
Research in basic science	.6	.5	.6
Patents	.3	.2	.3
Safety engineering	.3	.3	.3
Student	1.8	.3	.3
Unemployed	.2	.1	.3
Personnel-labor problems	.2	.2	.2
Teaching, other	.3	.3	.2
Library and information service	.1	f	f
Retired	.1	.2	.2
Total (number actually reporting)	30,922	36,434	37,545

f. Less than 0.05 percent



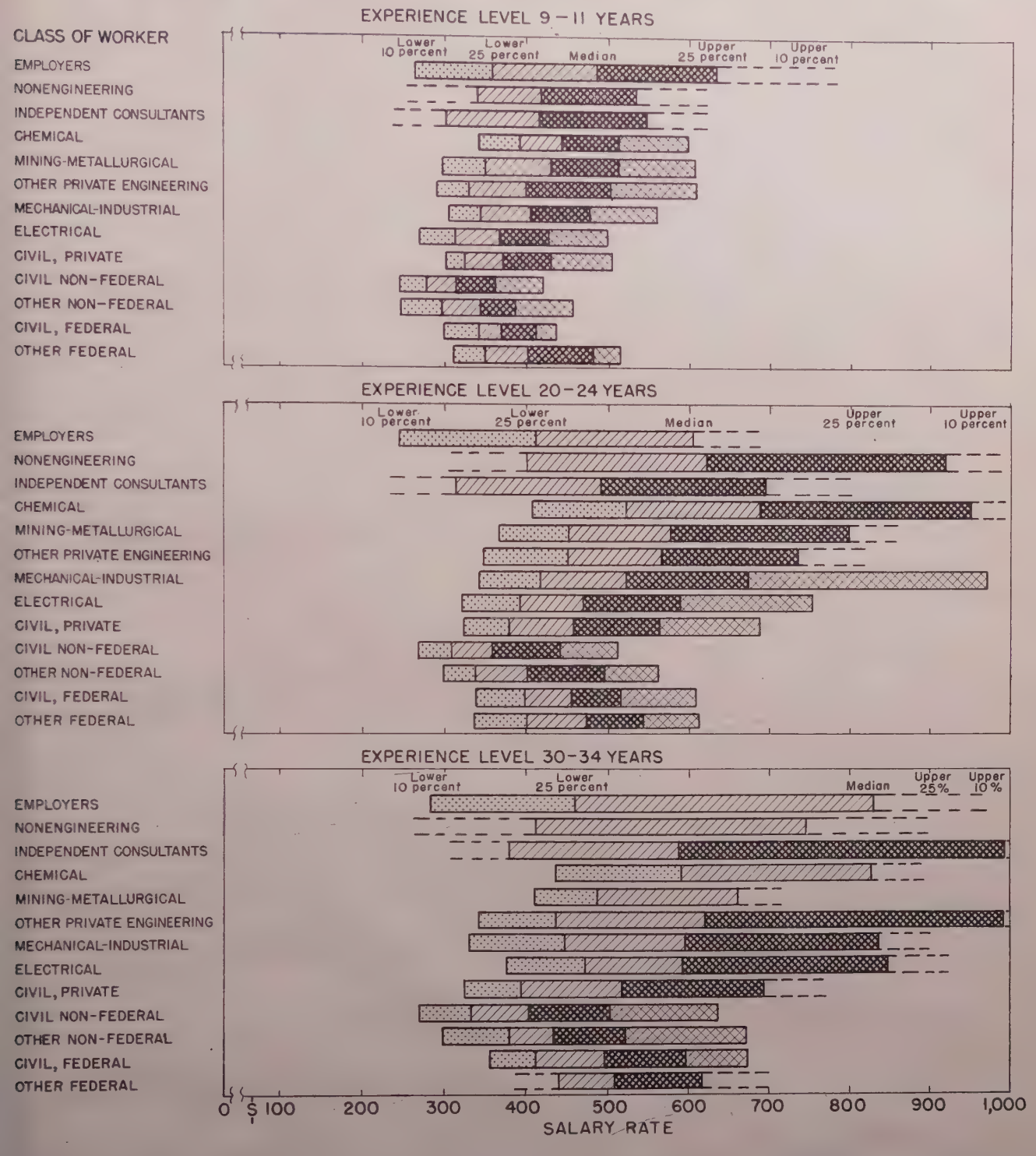


and by 1943 the percentage of graduates had increased to 81. A further slight shift in favor of graduates is expected before 1950.

The Andrew Frazer study, entitled "The Engineering Profession in Transition," is a compilation of significant statistics about engineers and the engineering profession. Members of the EJC Committee on the 1946 Survey of the Engineering Profession and its superior committee, the Committee on the Economic Status of the Engineer, are: The National Society of Profes[illegible] Engineers, American Society [illegible] Civil Engineers, American Ins[illegible] of Mining and Metallurgical [illegible] gineers, and American Institu[illegible] Chemical Engineers.

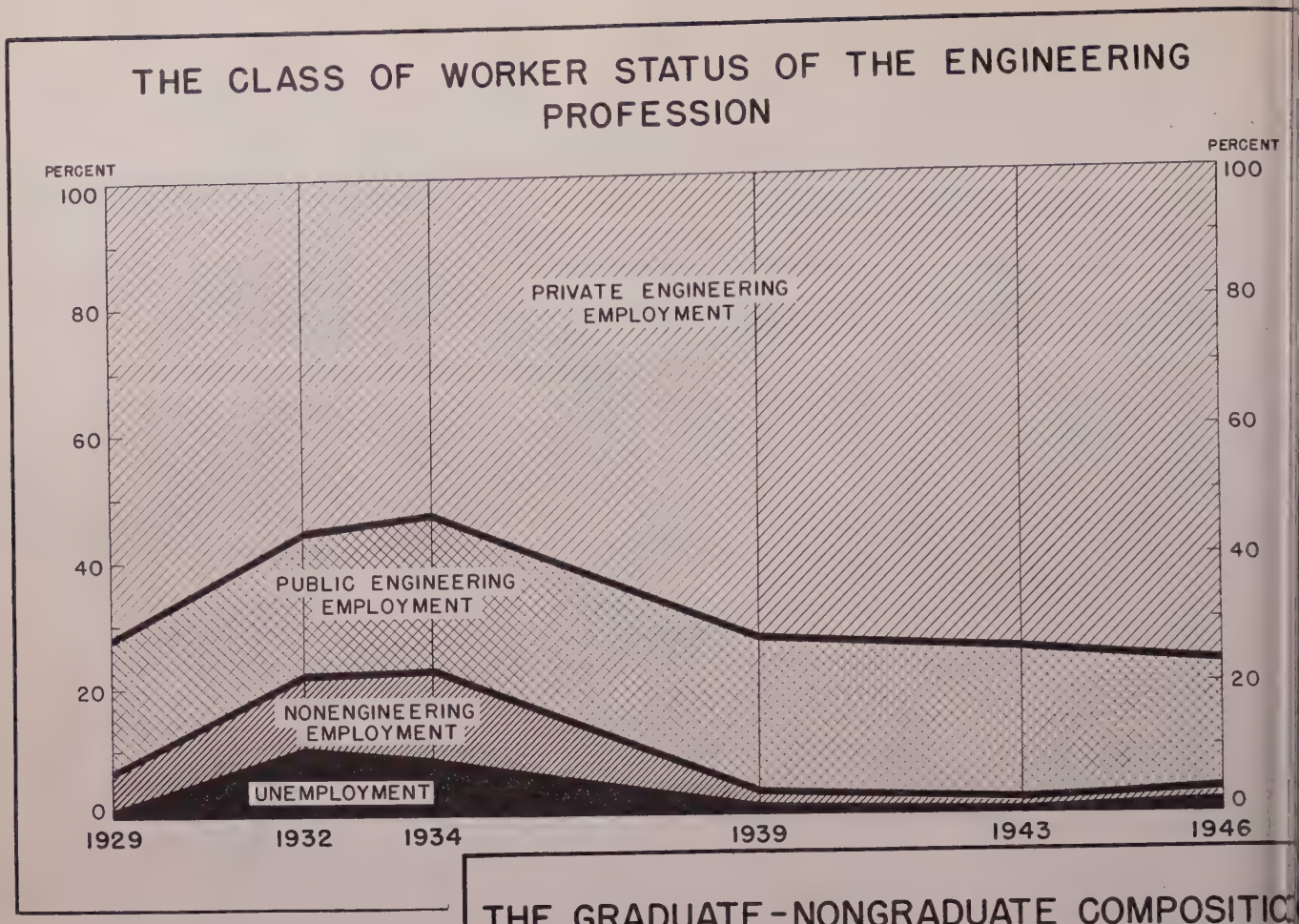
There were approximately

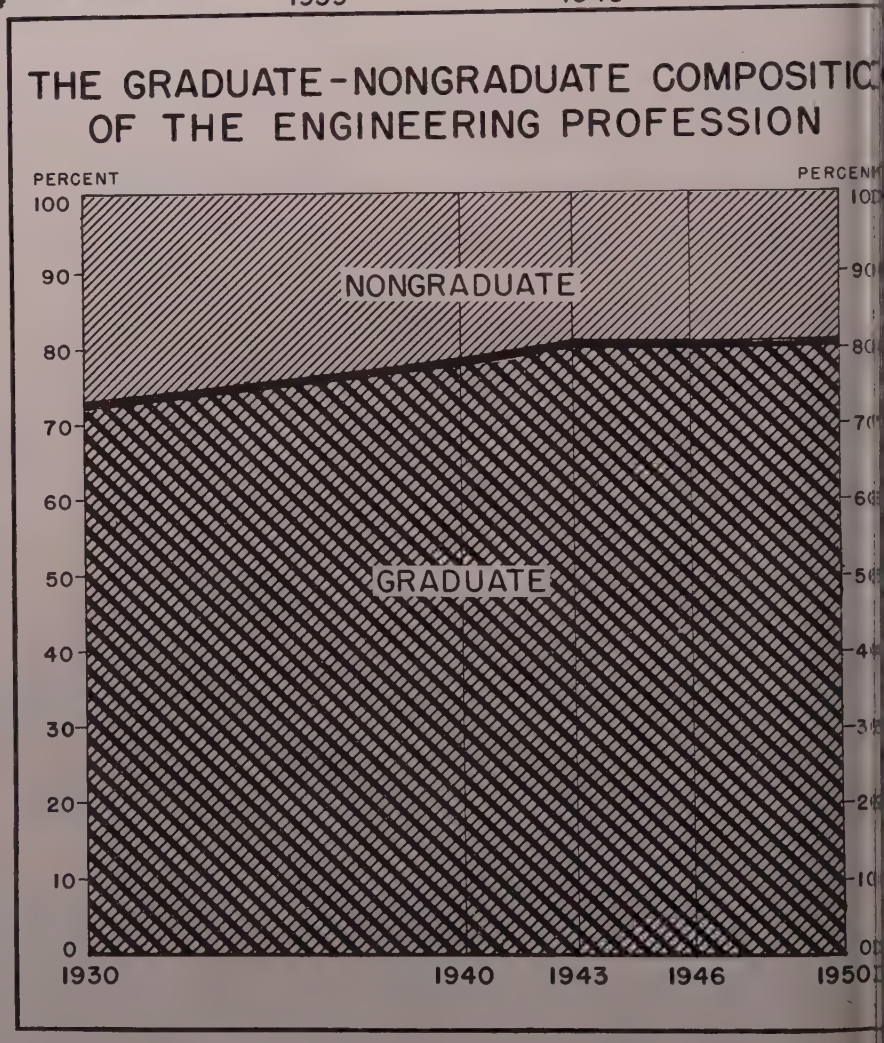
COMPARISON OF FIVE LEVELS OF BASE MONTHLY SALARY RATES OF PROFESSIONAL ENGINEERS BY CLASS OF WORKER FOR SELECTED EXPERIENCE LEVELS IN 1946



engineers in the United States of March, 1946, according to the ort. This figure is somewhat ger than previous estimates which e been made as to the size of the fession. (See chart page 18.) By March of 1950 there will be about 336,772 engineers in the country according to the forecast made by Mr. Frazer. This represents an increase of 32.3 percent over the March 1940 figures which is the latest available from the Bureau of the Census.

The growth of the number of practicing engineers indicates that persons have been entering the field at a greater rate since 1940 than they did between 1930 and 1940. If this accelerated rate of growth continues until 1950, the report indicates, the





total number of engineers will reach the 366,772 figure. In considering this rate of growth, however, it should be noted that the profession is not now expanding as rapidly as it did from 1920 to 1930. During this period, the number of engineers increased 66.2 percent, according to Bureau of Census figures.

The report classifies the engineering profession as to those engaged in private engineering employment, public engineering employment, nonengineering employment, and unemployed. It shows that there has been some slight shift among these various classes during the seven years from 1939 through 1946. These shifts are explained by the variation in employment of engineers by the Federal Government during the World War II years. (See chart opposite.)

The report also classifies workers as to their occupational status, as shown in the table on page 7.

The study indicates that the percentage of employer engineers is extremely small, being as of 1946 only 7 percent of the engineers who entered the profession prior to 1940. Among younger engineers, as ex-

(*Continued on Page* 18)

egislative Committee's lonthly Report

e Recently adjourned Congress passed much legislation of impor-ıce to the engineering profession, but at the same time it left much dône. A brief summary of major bills passed, and those left for ture action follows.

Fellow Member:

ıe Legislative Committee re-ort, analyzing the Taft-Hart-y Act, printed in the July sue of The American Engi-eer, closed with a request at our members submit to e Washington Office reports ı the application of this law the profession as they are xperienced and observed on e local level. This assist-ıce is absolutely necessary the Legislative Committee to operate at the maximum dvantage in this connection. 'e desire to reiterate this re-uest and urge each and very member to constitute mself a Committee of One notify the Washington Of-e of all developments under e new law pertaining to rofessional employees, par-cularly professional engi-eers, of which they have per-nal knowledge, or which ome to their attention.

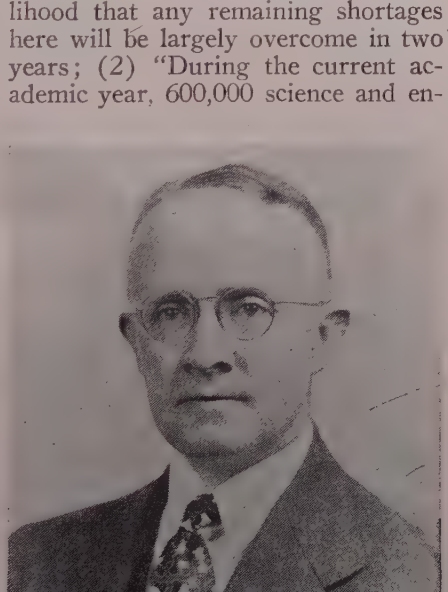
conjunction with the current bership Drive a specially printed of the Legislative Bulletin has issued. At the risk of repeating mation which some members already have, the following dis-on will attempt a brief review of of the highlights of the first on of Congress.

e outstanding single develop-was the Taft-Hartley Act, ı has been fully discussed in egislative Bulletin and to some t in this column. It is our in-n to continue a series of run-reports on developments un-his law as they take place, with assistance, as noted in the box

tional Science Foundation

sident Truman surprised a er of those who have been in-ed in the creation of a National ce Foundation by his pocket-veto. The President objected strongly to vesting administrative authority in a part-time governing body of 4 members, terming this arrangement as "complex and unwieldy" and a "marked departure from sound principles of administration."

The President is still strongly in favor of such a Foundation and undoubtedly another attempt will be made to establish such an organization at the next session of Congress. A thorough discussion of the necessity for the Foundation is contained in a recent report by John R. Steelman, Chairman of the President's Scientific Research Board. This meaty report will be reviewed at some length in a future issue of the Legislative Bulletin. The report echoes the President's feeling that the National Science Foundation should be headed by a Director appointed by the President and assisted by a part-time advistory board. Meanwhile, it is interesting to note several conclusions of the report pertaining directly to engineers. They are: (1) "There appears to be less stringency in the engineering fields than in many others and present enrollments in engineering schools suggest the likelihood that any remaining shortages here will be largely overcome in two years; (2) "During the current academic year, 600,000 science and engineering majors were enrolled in colleges and universities—the highest number in history. One-third of these were in engineering;" and (3) "The production of engineers, primarily utilized in development work, is at a very high level."



RAY M. FULLER

Other Developments

Medical Service Corps for the Army and Navy were approved by both Congress and the President. The MSC for the Army contains a Sanitary Engineering Section, which was inserted at almost the last moment. It is quite possible that an effort will be made at the next session to form a Technical Service Corps, which is considered a better arrangement for sanitary engineers by many observers.

The prohibition of ground-water surveys by the Geological Survey was removed after a number of protests, including NSPE's, and the final appropriation bill for the Interior allows such activity to continue.

Some of the legislation in which we have been interested, but which has not passed Congress includes: The "Fulbright" bill which was revised from a measure for governmental assistance to research to one providing only a clearing house for scientific and engineering information.

The "Mundt" bill would allow the government to provide technical services for foreign governments under restrictions as to construction and supervision of public works.

The Water Pollution Control bill was passed by the Senate and awaits House action. It provides for loans and advances through the Federal Works Agency.

The Advance Planning legislation went as far as a hearing in the Senate but did not pass either House.

The St. Lawrence Seaway project is due for early consideration at the next session, having been favorably reported by the Senate Committee.

The question of Valley Authorities and alternative approaches to flood control legislation promises a lively battle. The President has indicated that Valley Authorities must be deferred in favor of flood control projects for the time being.

Another "hot" issue of the first session was the W-E-T Housing Bill which made no progress after being approved by the Senate Committee. This promises to be another key issue in the next session.

Cordially yours,

Ray M. Fuller

Federal Aid Highway Program Requires Advance Engineering Plans

Many of the nation's highways, roads, and streets are like Topsy—they just grew. Little if any coordinated planning went into their development. The engineer was called in only after decisions had been reached to build a road or a street with the result that our existing facilities are a hodge podge. Recently, legislation has been passed to correct this situation. The following article discusses the program.

By THOMAS H. MacDONALD

The most compelling drive behind engineering research and engineering operations is the pressure exerted by social and economic problems. As problems in these fields become too extensive in their scope or too acute in their adverse effects to be longer ignored, various phases are placed in the laps of the engineers for solution, frequently with the public tongue in cheek.

Possibly our engineering attack has been characterized by the adoption of limited objectives, or at the other extreme, the proposal of grandiose schemes so elaborate that they fall under their own weight. Yet, such is the technological competence of the United States that, once in motion, the engineering techniques move quickly beyond the equally important concomitants of administration and financing.

This is particularly true in the field of highway development. No one will question the rapid progress that has been made in the development of materials, in engineering design and construction methods. The amazing plethora of equipment that has come into daily use for the building of highways is only equalled by the fantastic production of automotive equipment to operate over them. Before these engineering techniques can come to the relief of the cities to aid them in their traffic dilemmas and the redesign of the historic, but outgrown city pattern, there must first be available the necessary administrative authority, including legislation and continuing financial support.

Federal Legislation

This discussion is designed to examine new Federal highway legislation and its potentials for real assistance to the cities whose traffic problems are literally suffocating them and and whose relief requires major operations.

The Federal-Aid Highway Act of 1944 holds greater promise of aid to the cities than any other recent national legislation, because it supplies the two essentials of a definite long-term administrative pattern and financial assistance reasonably comparable to the work that can be actually accomplished under existing conditions. To evaluate this new legislation it is necessary to review the concepts of the earlier legislation and those which are embodied in the current Act. The Federal-Aid Highway Act of 1944 alone, among all highway legislation in the countries of the world, aims at the achievement of an integrated development of the major classes of streets and highways to effect an ultimate national traffic network. In

Thomas H. MacDonald, Commissioner Public Roads Administration

this, its principal characteristic, it abandons the limited objectives of the Federal Highway Act of 1921 and all State legislation of the earlier period, to recognize, and provide for, the revolutionary changes that have occurred in a quarter of a century in the character of highway improvement needs.

In 1921 the preponderant need, clearly recognized as such, was for the creation of a principal rural highway system. The Federal and State highway laws of the same period centered upon this single objective, a cooperative and sustained attack c culated to achieve maximum milea service in the shortest possible tim The Federal and State Acts alike e bodied these salient principles: T designation of limited systems main inter-urban, rural highwa and the allocation of ear-mark funds for use in the improvement the limited systems designated.

Two Conditions

Thus, at the very outset of the markable activity in highway dev opment that distinguished the t decades from 1920 to 1940, the t conditions vital to the success of t activity were firmly established law. These conditions, as already dicated, were:

1. A definite objective; and
2. An assurance of continu financial support.

Individuals narrowly concer with the interests of cities on the hand, and persons shortsightly garding rural interests on the ot with some show of superficial v rant, might have condemned the *clusions* of these first modern h way charters. Nearly all the laws acted not only did not *provide* the improvement of streets in ci but actually by specific exception *hibited* expenditure of the funds created for any work inward of fringes of cities. And, all alike, excluded from the systems of rural highways by far the larger tion of rural road mileage, and the part most intimately locate relation to rural homes.

The fact is that in the earlier y at least, scarcely a voice was r in opposition. City people, well isfied generally with the conditi their streets, cheerfully paid in use taxes the lion's share of the of the inter-urban rural highv which actually they desired abov else. And rural people in genera cepted the practicable improve

Based on speech delivered before ness Men's Conference on Urban lems, U. S. Chamber of Commerce, temer 11, 1947.

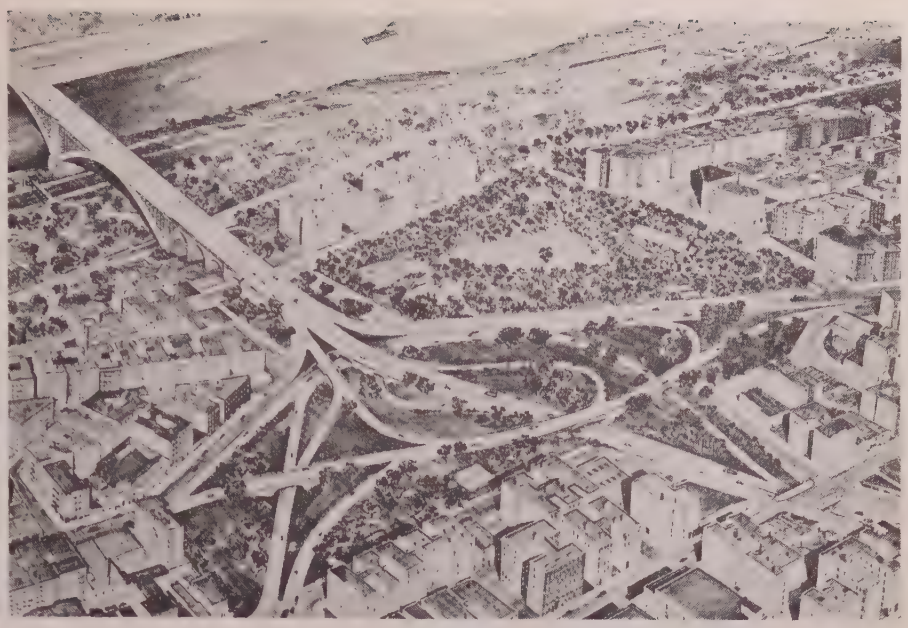
the longer part of their several
tes to town as the more important
t of the interminable task of road
lding to everyman's gate.

The soundness of the pioneer poli-
s was abundantly attested by their
ults. In less than three decades,
ile the flow of motor vehicle traf-
grow from a trickle to a flood, a
tem of primary rural highways
lved from virtual impassability to
tate approaching a reasonable de-
e of adequacy for the needs of the
rld's greatest highway movement.
anwhile, however, there was an
reasing appreciation of the short-
nings deliberately incurred when
policies were originally adopted,
l a gradual relaxation of the re-
ous strictness of the exclusions.

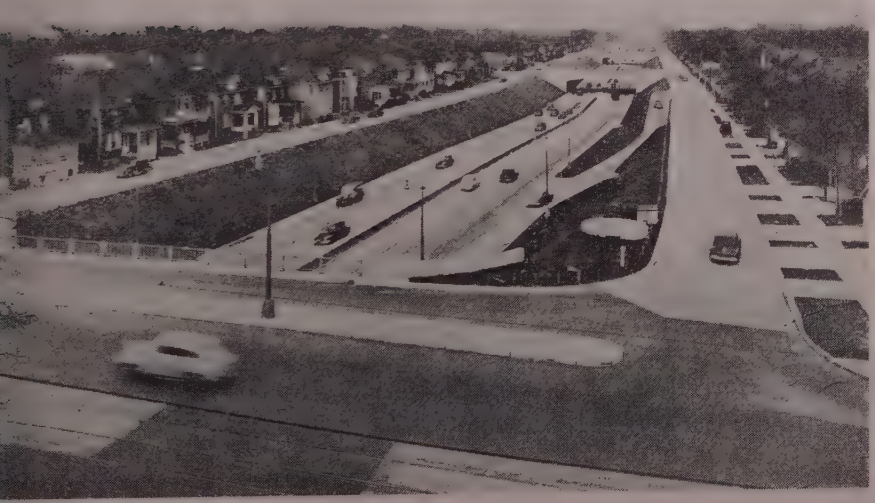
Funds For Cities

Expenditure of Federal highway
nds in cities became permissible by
endment of the Federal Highway
t in 1933, and likewise, provision
s made for the expenditure of
deral funds in the improvement of
ondary or so-called farm-to-mar-
roads. Permission to expend
ate highway funds on connections
the State system in cities has been
ned by State enactments generally
st-dating the Federal law amend-
nt; as yet, however, in a number
States, no State fund is provided
expenditure on rural roads not in-
ded in the primary State highway
tem.

But, whereas the States have been
w to provide funds *under State control* for the improvement of city streets and secondary rural roads, a tendency, emerging earlier, to apportion increasing parts of the State-collected road-user taxes to government subdivisions for expenditure on city streets and local rural roads, has developed more rapidly. This situation evidences a lack of appreciation of the moderating and unifying role which the State may desirably perform to assure an expenditure of the road-user revenues of maximum benefit to road users generally. It evidences, on the other hand, a far less desirable tendency to apportion road-user revenues by legislative edict, without benefit of a general plan, as a resultant of competing claims advanced by the State highway department, the counties and municipalities of the State. The consequences of this tendency to date are reflected in the disposition of road-user revenues in 1946. The record for this latest year shows a total of $1,410,539,000 allotted for road and street purposes including debt service, of which $997,877,000, or 70.7 per cent was allotted for expenditure by the State highway departments; $350,547,000 or 24.9 per cent, was allotted to counties and lesser subdivisions for expenditure; and $62,115,000, or 4.4 per cent, was directly allocated for expenditure by municipalities. Making full allowances for the known fact that some part of the revenues available for expenditure by the State highway departments and the counties is expended on city streets, the obvious inference from these figures is that the cities have not received much recognition in the competition for the direct allocation of road-user revenues.



New York City Project
Proposed design for traffic interchange at east end of Washington Bridge across the Harlem River, to be part of the Cross-Bronx Thruway.



Typical Urban Section of Interstate System
Davison Limited Highway in Detroit, Michigan, completed in 1942 illustrates ressed expressways planned for City programs.

Highway Act of 1944

Into this situation the Federal-Aid Highway Act of 1944 comes as a new dispensation, radiant with promise, for the cities especially. Of the $500,000,000 total Federal appropriation authorized for each of the first three post-war years, $125,000,000 is earmarked exclusively for expendi-

ture in "urban areas", defined as areas including and adjacent to municipalities of 5,000 population or more. These funds, representing an even 25 per cent of the total appropriations authorized, are made available for expenditure solely upon the Federal-aid highways system selected to serve the urban areas. "Urban area" is a new legal concept which disregards the boundary lines of governmental subdivisions and encompasses municipal and surburban satellite areas in a single district defined by traffic. It recognizes the expansion of the city as a fact.

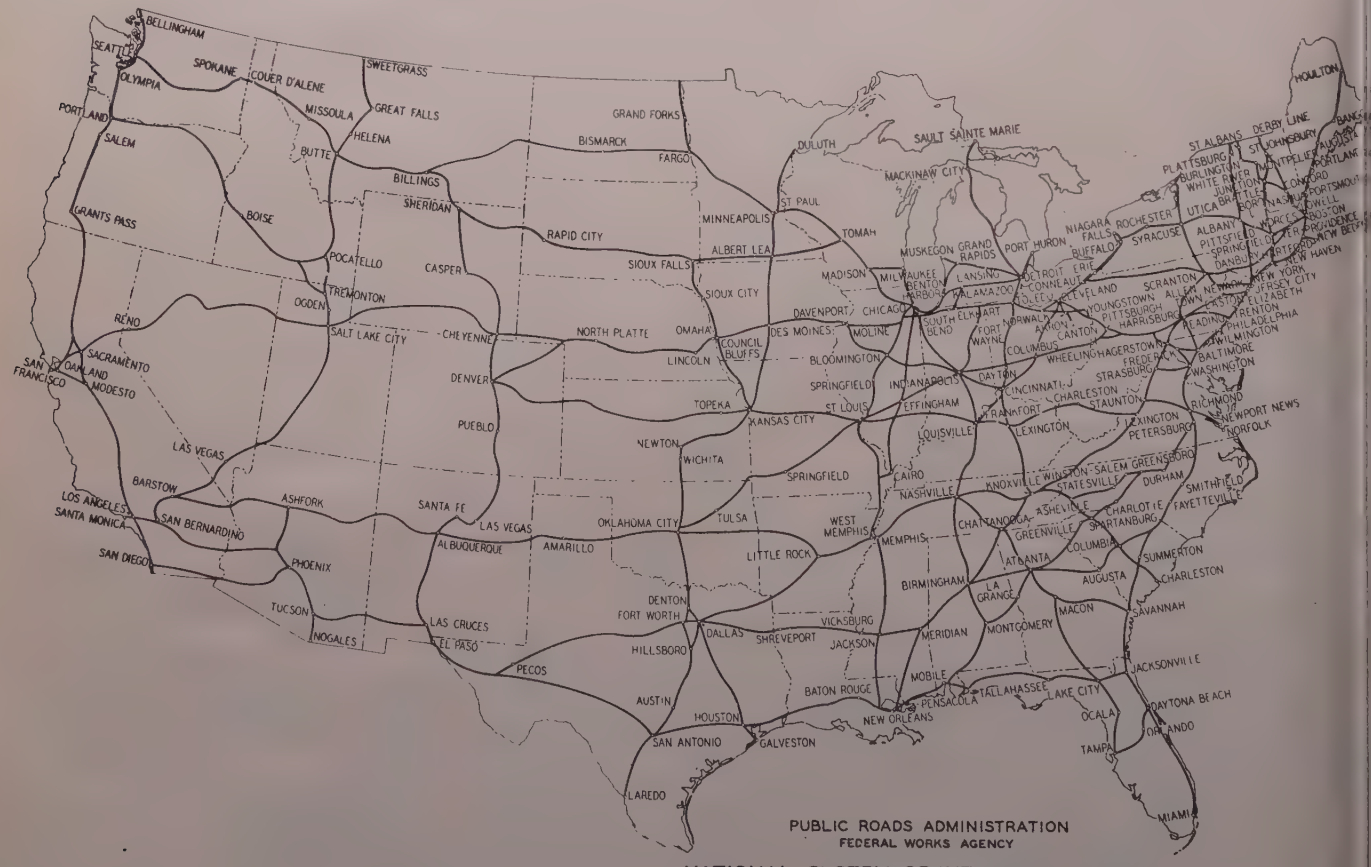
Federal Fund

This Federal "earmarked" fund is a substantial contribution to the financial resources of cities. The $125,000,000 annual authorization, distributed evenly among all the urban areas in which it may legally be expended, would represent an expenditure per capita of the included cities of $1.80, on the basis of the 1940 population. This $1.80 per capita is made available for construction only of the principal thoroughfares included in the Federal-aid urban highway system. If $1.80 per capita does not seem an impressive provision to aid in the construction of principal city arteries, then let us compare this figure with the total current expenditures of the same cities for *construction, maintenance, administration and interest payment on all roads and streets* under their jurisdiction, on the basis of the same 1940 population figures, which is approximately $3.65 per capita. The Federal contribution for construction of main arteries only, evenly distributed in each year, is therefore approximately 50 per cent of the amount the cities are spending of their own funds, for all road and street purposes. And this assumes that the Federal funds for each year will be evenly distributed among all eligible urban areas, which, of course, is not the case. Applied, as it actually will be, to durable construction in urban areas differently selected in each year, the Federal contribution will represent, to the areas benefitted in each year, an addition to the year's expenditure of city funds far above the 50 per cent ratio of the even distribution. Although the actual rate of expenditure has not yet equaled the authorized amount, the new specific Federal aid to urban highway construction is reasonably scaled.

Yet the funds particularly earmarked for urban-area expenditure by the 1944 Act do not measure the total of benefits that will accrue to cities under its provisions. The act also authorizes annual appropriations of $225,000,000 for expenditure on the primary Federal-aid system either within or without cities. Undoubtedly, a substantial portion of the funds as authorized will be expended for purposes of direct benefit to the cities.

Integrated Development

We would do scant justice to the broad purposes of the Federal-Aid Highway Act of 1944—even in a conference such as this,—in which the primary concern is addressed to urban interests—if we were to emphasize unduly the direct fiscal benefits of the Act to cities. More importantly, the Federal Act aims at nothing less than the achievement of an integrated development of all the major classes of streets and highways, comprising the nation's street and highway network. Naturally, therefore, it makes specific fiscal provision for the fulfillment of recognized highway needs of rural, as well as urban America. For the meeting of rural needs it provides, in addition to the $225,000,000 annual authorization for expenditure on the primary Federal-aid system, a further authorization of $150,000,000 appropriation for each of the first three post-war years, expendable only for the construction of principal secondary and feeder roads. The authorization for primary highways, though avail-



PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

NATIONAL SYSTEM OF INTERSTATE HIGHWAYS

SELECTED BY JOINT ACTION OF THE SEVERAL STATE HIGHWAY DEPARTMENTS
AS MODIFIED AND APPROVED
BY THE ADMINISTRATOR, FEDERAL WORKS AGENCY
AUGUST 2, 1947

for expenditure on such high-
s both within and without cities,
reviously stated, will doubtless be
ted in major part to the bulk of
primary Federal-aid system
ch consists of the principal rural
ways joining the cities. The
ls authorized for secondary and
er roads are to be expended
lly outside of urban areas, and
usively upon the most important
l roads of this class, included in
ems by joint action of State,
nty and Federal highway authori-

ll of these systems, for the selec-
or recognition of which the Act
vides—the national interstate sys-
the Federal-aid system in urban
s, the Federal aid primary inter-
an system and the principal secon-
and feeder road system—when
are completely designated, will
bine to form a composite, inte-
ed national network comprising
highways and streets of any real
erality of usage. Together, they
probably serve not less than 85
cent of the total vehicle-mileage
highway transportation; and they
accomplish this large measure of
ice by the inclusion of not much
e than 20 per cent of the total
age of roads and streets. The
e remainder of mileage will con-
in its rural components, of ter-
y and purely land-access roads,
in its urban components, of the
hborhood and residential streets
he cities. With sound reason ex-
led from the systems to which
eral-aid is extended, this mileage
actually constitute a residual sys-
alike in its urban and rural com-
ents, serving the most local of
way transportation functions.
Designation of the several systems
isaged by the 1944 Act is pre-
ling with reasonable promptness.
date, more than 350,000 miles, in-
ing a substantial mileage in cities
less than 5,000 population, has
selected for inclusion in the sec-
ary and feeder road system.

Interstate Highways

f greater interest to the larger
s doubtless, is the designation,
ounced on August 2, of the com-
intercity network of the national
em of interstate highways. This
ork, comprising 37,681 of the
00-mile eventual extent of the en-
system, includes 2,882 miles in
s, forming the principal exten-
s into and through the connected
s. The remainder of 2,319 miles
been reserved to permit addition
he larger cities of distribution

Chicago Loop Area Plan

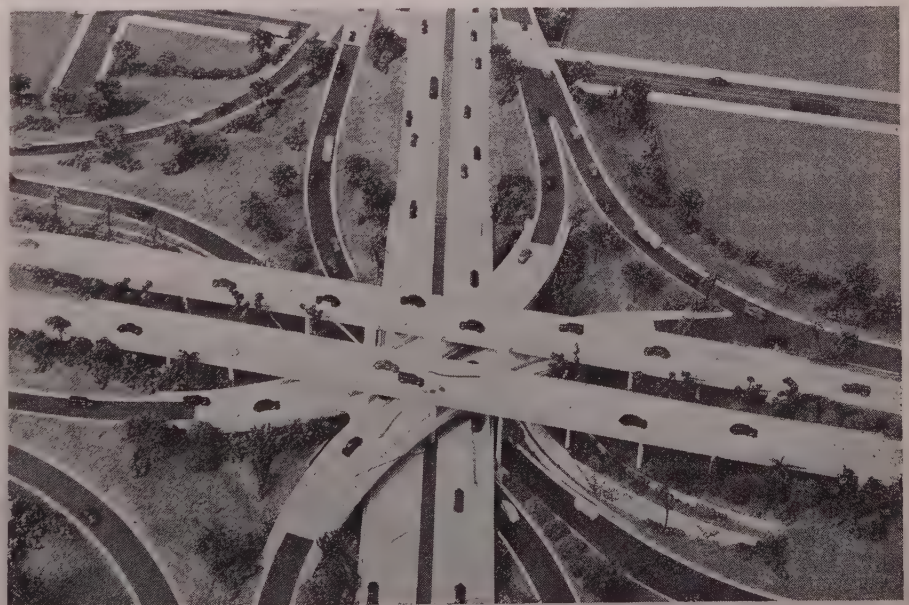
Proposed design for section of Congress Street Expressway with both traffic distribution and parking facilities shown.

and circumferential routes, essential as terminal connections of the system. Designation of this further mileage in cities, now under way, requires the close cooperation of city, State and Federal authorities.

The additional designation of interstate highway routes in the cities will proceed simultaneously with the further selection of routes for addition to the Federal-aid system in urban areas. The latter selection will embrace the former, and in addition will include the routes of substantial importance as arteries within the urban areas. The result will be a large expansion of the existing Federal-aid mileage in the urban areas, and of course a corresponding increase in the scope of application of the Federal urban-area funds.

Planning Requirement

It is in its requirement of the planning of these systems, rather than in the appropriations it au-



Los Angeles Project

Proposed 4-level structure at intersection of Hollywood Freeway and Arrogo Seco-Harbor Freeways in downtown section of city. Construction was started July 1, 1947.

thorizes for a short term of years, that the great fundamental merit of the 1944 Act is to be found. By the fact that the new system selection it requires will accomplish a complete functional classification of all roads and streets, differentiating clearly between the two general classes of arterial and land-service facilities in both urban and rural areas, the 1944 Act is distinguished from the parent Act of 1921, which provided for only a partial classification, and expedient first measure of planning. And by the further fact that the new classification and system selection is to be accomplished by the joint decision of all affected jurisdictions, municipal, county, State and Federal, the resulting new determination is stamped as a truly "federal" highway program. It will be rather a wholly unified or federated program, requiring for its realization the associated action of government at all levels. It will be the Federal program only in the sense that it will define or fix the purposes of future highway contributions of the National Government, with virtual certainty, for years to come, even as lesser purposes and objectives were fixed for more than two decades by the Federal Highway Act of 1921.

The great difference between the new and the old programs, as far as the cities are concerned, is that the cities are to be as closely associated in the new, as they were definitely excluded at the inception of the old program.

Cities Not By-Passed

The time when highway needs of the cities might be regarded as of lesser concern than rural needs, is past, and too long past. No finding of the State-wide highway planning surveys is more clearly established than the fact tthat tthe tides of rural highway movement have either their origins or their destinations predominantly in the urban areas. No longer tenable is the idea, once prevalent, that cities are places to be avoided or by-passed by through highways. With certainty, we know now that the traffic that moves on these primary rural highways in the vicin of every city is, in its majority, traffic destined to, originated in, t city; that this majority rises to per cent or more in the vicinity the largest cities, and remains st stantial in the vicinity of cities mu smaller, even down to thte town 5,000 population. It is clear, the fore, that the rural highways m have adequate connection into, a through the cities, if their traffic is be properly facilitated to its p dominantly city destinations, a from its predominantly city origi

Within the city, the routes that needed to extend and cross-conn the external primary highways generally found to coincide with m jor arteries serving heavy inter movements from residence quart to the central business section of city. But while these usually ra connections of the primary r highways are often the most imp tant arteries of city traffic flow, th usually are other lines of heavy terial movement, either actual or tential, that can be readily dis guished by origin-and-destinat traffic surveys.

Inadequate Facilities

With few exceptions, these imp tant urban arterial traffic flows now inadequately served by ordin city streets, in which they are mi with a great deal of local movem and obstructed at numerous st intersections by traffic lights cross flows. Substantial volumes arterial movement between oppo sides of the city now follow exis streets directly through the cen business section, and though t have neither origin nor destina there, add their burden to streets ready crowded with essential l ness movements. Origin-and-dest tion surveys have shown that movement in transit through the l ness section may bulk as large a per cent of all street traffic in area; probably it is at least one-t of the total business-section traff all cities. The apparent need in connection is the provision of f flowing, belt arteries, closely en cling the business section, by w cross-city traffic can be conv from one radial artery to an without passing through the cen area.

In its relation to the cities, Federal program contemplates, a clear definition of these es tial lines of arterial movement, thereafter a sustained applica of city and, perhaps, State funds nually available, with Federal

Cross-Bronx Expressway

Proposal for New York City, showing underpass at Grant Circle. An elevated railway crosses the circle.

er what may well be the long riod necessary to develop, in each y, a needed system of highways de- ned for the special service of ar- ial traffic. The program will not clude any needed provision of outer cumferential highways, though it y properly contemplate the loca- n of such routes in such manner to serve the need for connection tween outlying urban sections, as ll as the more commonly recog- ed objective of city avoidance for rough-highway traffic.

Engineering Reports

The task of designating additional ban routes of the interstate and deral-aid systems is the essential st act of this program. It is a k that can be greatly facilitated traffic origin-and-destination sur- ys, and one, indeed, that cannot perly be completed in the absence such surveys. Federal funds e available, at the disposition of State highway departments, to fray part of the survey costs, and ve already been so used on sur- ys undertaken in more than 60 es. Preliminary engineering re- rts have been made or are to be de in one hundred cities.

Use of the Federal urban-area nds authorized for construction, ich preferably should have fol- ved a more deliberate planning paration, has necessarily begun cause of the pressing need for a rt toward traffic relief. We hope direct the immediate construction penditure to projects, and types l locations of improvement, likely accord reasonably with the mature gram of later development.

As of August 15, more than 85 cent of the urban-area funds horized for the first post-war year l been programmed for specific jects. Also at the middle of Au- st, nearly 50 per cent of the funds horized for the second year had n programmed; and the time for mplete obligation of these funds ends to June 30, 1949. In view the difficulties attendant upon the nching of a new program, as yet than two years in force, these omplishments indicate a satis- tory rate of progress.

Of the combined apportionments the fiscal years 1946 and 1947, ounting to $243,750,000 only 130,450, or 2.5 per cent, has been grammed for improvements which not provide at least one addi- al traffic lane. These projects, in- volving 80.5 miles of streets, are lo- cated generally in small towns. Pro- jects involving 296.1 miles, and pro- viding for the addition of at least one, and generally more than one lane, have been allotted $31,096,993, or 12.7 per cent of the two-year ap- portionment. High-type improve- ments, with road-ways centrally di- vided, but without controlled access, and with only an occasional grade separation at intersections, planned for 137.9 miles, have been allotted $30,233,162, or 12.4 per cent of the combined apportionment. 62 pro- jects provide for needed protection at railway-high-way crossings, gen- erally by the separation of grades. To these the allotment is $19,629,079, or 8.1 per cent of the apportionment for the two years. But, especially pleasing, are 144 projects which will result in the construction of 138.3 miles of new urban expressways, with all intersection grades separated and complete access control. To these goes the largest share of the apportioned funds, an allotment of $77,412,645, or 31.8 per cent of the total. Properly, these projects are lo- cated in the larger cities. Their com- pletion will nearly double the mile- age of expressways now existing.

Continued Need of Funds

There is altogether too much fear of the so-called decentralizing effect of expressways. The type of de- centralization now in progress is in- evitable, expressways or no express- ways. Our cities are expanding, *de- densifying,* to use the action term. In the expressways now planned we see only the beginning of provisions of the strong, new transportational bonds that are needed to tie the fu- ture wider spread of metropolitan areas to the urban centers. Concern may be more constructively directed to the extension of municipal limits to encompass the actual spread of urban aggregations, or (perhaps more properly *and*) to other meas- ures, financial and legal, admini- strative and planning, which will con- duce in other ways, as positively as expressways within the scope of their potentialities, to the cohesive and harmonious development of the in- evitably enlarging metropolitan areas.

Truly the provisions of the 1944 Federal Act define a national pro- gram fixing anew the broad purposes of a long period of constructive ac- tivity toward the development of a main rural highway system.

One thing more is needed. That is a reasonable assurance of the steadfast continuance of financial support needed to carry out the pro- gram. For most effective planning of the continuing activity, the finances to be available, as nearly as possible, should be of assured or predictable amount. The Federal-Aid Highway Act of 1944 gives notice of the ex- tent of the Federal Government's contribution for only three years. We are approaching the time when the authorization must be extended for a further period. Desirably, the Federal intent should be expressed in terms of annual authorizations con- tinuing over a period longer than three years, for two compelling rea- sons. The highway plant has reached such dimensions and accumulated so extensive obsolescence, a large annual reconstruction program is necessary to maintain a reasonable degree of service. Also, the projects that will render maximum service, particularly in urban areas, can only be under- taken on a stage construction basis.

Summary

In summary, we have in the 1944 Federal-Aid Highway Act, a truly national pattern for administration. Also, a reasonably adequate financing to provide a substantial initial pro- gram in each of the major classes of highways. It vitalizes the concept of an arterial traffic circulation system for each urban area and the engineer- ing techniques are available to select these with certainty for the future. A spirit of tolerance and faith on the part of both public and officials will insure successful progress in meeting certain phases of the social and eco- nomic problems now characteristic of our municipalities. Each one of the problems which can be met by more efficient internal transportation re- quires land. Controlled-access arter- ials, improved transit, better termi- nals, sufficient parking areas, parks and parkways and all other of such elements that will be characteristic of the re-designed modern city—must reconvert space now used for less im- portant purposes. It is fortunate, and not a catastrophe that people are establishing their homes outside the central city areas. The space thus vacated is needed for other public purposes. It is a happy circumstance that living conditions for the family can be re-established and permit the social as well as economic decay at the heart of the cities to be converted to a public asset. It is certain that the cities face a bright rather than a disastrous future if faith and courage are at the helm.

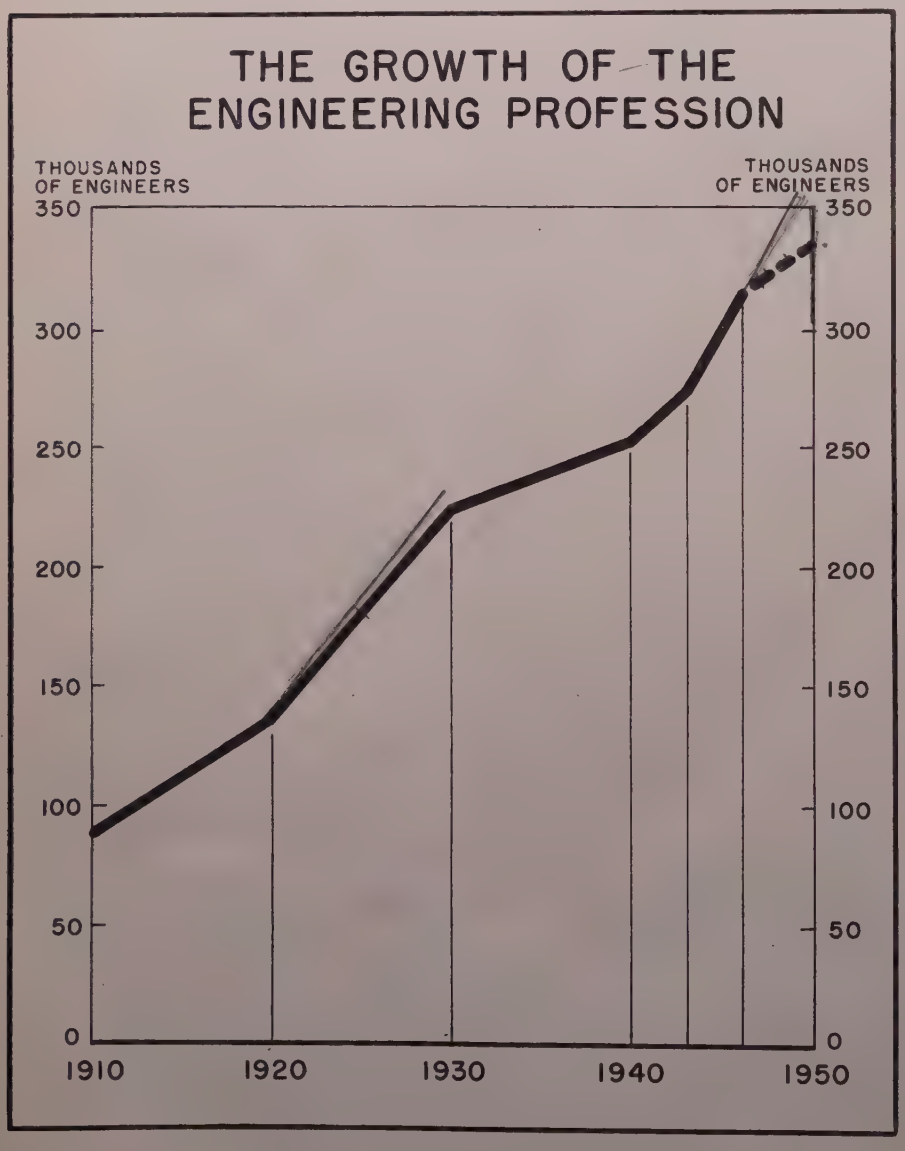
Engineers Help Purchasing Agents

(*Continued from Page* 4)

nish performance and service data on equipment and materials that is more significant than that which a testing laboratory could furnish. For example, the acid test of a conveyor belt always comes when actual operating conditions are encountered. If the plant engineer patiently keeps continuous records of the life, repair cost and tonnage handled by each conveyor belt, and sees that his purchasing agent has access to this information, then it is certain that the P. A. can do a better job of purchasing when he is buying a new conveyor belt for similar service.

But during these days of shortages, the engineer must frequently accept something other than that which he requisitioned. If he is open-minded, he will approve such changes and substitutions, and will follow the performance of such materials or equipment with that scientific attitude which seeks only after true facts, even though they are contrary to his pre-conceived ideas. No true engineer "sees to it that it doesn't work" just because he didn't have his own way at the start. (You think that such childishness doesn't occasionally show up? Well, thank goodness it is the exception and not the rule!) Of course, the engineer can often suggest a new source of supply or a fabricator that became known to him while on a trip or while he worked on a previous job.

At the beginning, I mentioned cost savings as one probable reason why engineers get a big kick out of helping the Purchasing Department. Another possible reason is that: "Purchasing must be fascinating work, otherwise everybody and his brother wouldn't try to take over the purchasing department's job."



Amateurs and Purchasing

Cooperation and help, we nee But we definitely object to amateu who try to perform the entire pu chasing function and consult t purchasing department *only* aft they've gotten themselves and t company into a jam. It does see strange that an otherwise reasonabl engineer will let a contractor start job on company property witho giving the purchasing department chance to negotiate a suitable co tract and thus safeguard the compa against exhorbitant costs, if not fa tastic losses due to personal injuri or property damage. Such neg gence, thoughtlessness or downrig willfullness cannot be excused on t basis that the engineer did not reali the unreasonable risks to which subjected his company. After a

Transition Report

(*Continued from Page* 10)

pected, the percentage is extreme small, being only 2 percent of tho who entered the profession fro 1944 through 1946.

All men entering the engineerin profession start at about the sam salary, according to the report, b as time goes on sharp differences earning powers develop, accordin to the particular occupational stat in which the engineer finds himsel

Median starting salary for ea of the occupational statuses review is slightly in excess of $200 a mont However, as the engineer gains experience, sharp differences in m dian salaries develop. For examp the median salary for an engine with 35-40 years of experience, em ployed in non-technical managemen administration, is between $900 an $1,000 a month, whereas the media salary of an engineer with that mu experience who is engaged in dra ing work is only slightly over $250 month. (See chart page 8.)

A similar comparison is made the report of base monthly sala rates of professional engineers varying experience levels by class of workers. The chart making th comparison is reproduced on pa 9. (Dotted lines extending from t bars indicate indeterminate figures

A general conclusion which can drawn for this data is: if compe sation is a factor in an engineers j considerations, his chances of ma ing a high income are best if he c engage in nontechnical manageme and administrative work, become employer or engage successfully work as an independent consultant

s not supposed to be expert at
e matters anymore than he is sup-
d to know how to do the work
ither the accounting department
he treasury department. But he
upposed to know that the com-
maintains a purchasing depart-
t of specially trained experts to
dle both procurement problems
contacts with vendors. He
ldn't try to sign a company check
thus usurp a treasury department
ction. But trying to do the pur-
ing department's work seems to
gue him periodically. "Purchas-
must be fascinating work . . ."

Decline With Salesmen

sually, an engineer knows very
e about our existing supply con-
ts, quantity discounts, vendor re-
nships, reciprocal problems, con-
t procedure, inquiry and quo-
n technique, the ethics of pur-
ing, etc. He is apt to be either
friendly with salesmen or too
l-boiled and dictatorial, if not
pous and demanding. When he
ely calls in a salesman and asks
an unreasonable amount of free
ice, it apparently does not occur
im that he is obligating his com-
y to that salesman. Then, if it
r leads to a purchase requisition
g written by the engineer, he may
ect to inform the purchasing de-
ment of his premliminary con-
s with that salesman on this par-
lar item. This could result in
ure to even send that salesman
inquiry, or invitation to bid, and
lose an order that he rightfully
ght belonged to him. Far
hed? No siree! It happened!
OK," you say, "Then how can
engineer help the purchasing
rtment?"
nd my best answer in a nut-
is, "By letting the pur-
ing department do its stuff to
the engineer!"
's still a two-way street paved
mutual respect, helpfulness, con-
ce, and cooperation!
Now wait a minute," you say.
ln't you start out by saying you
ted the engineers' help in pur-
ing and now you intimate you
t want them to interfere in your
ness! After all, you asked for it,
't you?"

Engineering Buyers

nd I say, "Yes, we do not only
for the engineers' cooperation,
we ask for engineering personnel
ne purchasing department where
become capable Engineering
ers, each a specialist in his own
p of commodities."

Nominations Committee Report

(*Continued from Page 6*)

School in 1919 and received his BS in Civil Engineering from Yale University in 1923. He was a Graduate Fellow at Yale from 1923 through 1924 and an Instructor in Civil Engineering from 1924 through 1929.

He joined the Boston and Maine Railroad in 1929 in its Construction Department. He was a Consulting Civil Engineer from 1931-33. In 1933 he went with the University of Maryland.

During his tenure at the University, Mr. Allen has engaged in part time consulting work, chiefly in structural engineering. He is National vice-president of Tau Beta Pi.

Mr. Allen was a national director of NSPE from Maryland in 1940, 1943 and from 1944 through 1946. He has served on the Constitution, Publications, Resolutions, and Budget Committees. He was a member of the Executive Committee in 1946 and 1947.

* * *

Attention is called to Article VII, Section 3 of the NSPE Constitution which permits nominations other than those by the Nominating Committee.

Each Nominee's name has been sent to his Member State Society for ratification and each state society has endorsed the nominations.

Each Nominee has been requested to accept the nomination and each has accepted in writing.

This report has the unanimous approval of all the Committee members.

But they are still engineers. And as such, they still ". . . don't pretend to know everything about everything." In fact, they still need, seek and use the constant help of the engineering departments. They are not too proud to ask for such help and they have no inhibitions about "showing their ignorance" when they ask the engineering department for information, counsel, and advice. Furthermore, they are glad to be constant help to those same engineers.

It really *does* work both ways!

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"GUNITE" CONTRACTORS

GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.

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The lower view shows the finished job completed by us in 1941. Both the upstream and downstream faces were restored with "GUNITE," as well as the wing walls.

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Richard A. Phelan, Pres., 1063 Broad Providence; Henry Ise, 15 Slocum Providence; Vincent DiMase, Sec., Dean St., Providence 3.

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Harry G. Kennedy, Pres., Kanawha C[oal] Operators Assn., Kanawha Valley Bl[dg.] Charleston; P. K. Pierpont, Nat. Dir., [1] College Ave., Bluefield; Ross B. Johns[on] Ex. Sec., Kanawha Hotel, Charleston.

Wisconsin

Walter A. Peirce, Pres., Manage[r] Water Department, Racine; A. G. Behli[n] Nat. Dir., 2326 S. 7th St., Milwaukee; [E.] Prof. Ben G. Elliott, Nat. Dir., 2302 C[om]monwealth Ave., Madison 5; O. J. M[ur]ge, Sec., 656 Crandall St., Madison 5.

Puerto Rico

C. Calor Mota, Pres., c/o Univ. [of] Puerto Rico, Mayaguez; Salvador C[as]nones, Nat. Dir., 20 E. Leland St., Ch[e]Chase, Md.; Angel Silva, Ex. Sec., D[ept.] of the Interior, Santurce

IEWS FROM THE VASHINGTON OFFICE

Although vacations and hot weather have been the rule during the past nth, the Washington Office has n busy with a number of projects interest to the membership.

On August 15 a most successful meeting of professional engineers was held in Los Angeles. Mr. Robert Coltharp, nominee for Vice-President of the Western Zone attended the eting. Over 200 engineers were attendance and they all indicated husiasm for development of a te society in California. Passage a new registration law permitting registration of all engineers in t State has created considerable husiasm for such an organization l it is expected that a California ciety of Professional Engineers l be the outgrowth of this ensiasm.

Mr. Walter Hester, Production nager of Baroid Sales Division in s Angeles has been an untiring rker for the good of the profession Southern California. Much credit due him for the initial steps in nging together the professional eneers of this region.

On August 19 a similar group of ineers met in San Francisco. Mr. tharp also met with the group in ı Francisco and it is expected that two groups will form the nucleus a state society.

Encouraging reports have also been eived on the formation of State ieties of Professional Engineers Florida and South Carolina. In th Carolina organizational meets have been held and constitual committees are hard at work. ctions have been scheduled and a nber of charter members have n accepted. Considerable credit is Mr. Rouse of Greenville for his rest and untiring efforts in promoting the professional movement in South Carolina.

For the purpose of acquainting more registered engineers with the values of affiliation with NSPE, considerable distribution was given to a Legislative Bulletin summarizing the activities of the 80th Congress as they affect engineers. This Bulletin was reproduced in quantity and distributed by each member state society to all registered professional engineers of their state. Considerable favorable comment has been received.

The Washington Office is now compiling a summary of changes which have occurred in the various state registration laws during the past year. These changes will be reported shortly in the AMERICAN ENGINEER.

Plans are rapidly taking shape for the program of the Annual Meeting in Buffalo. The New York State Society has indicated considerable activity in the formulation of these plans and a program of interest to every member is assured. Full details of the meeting and the program will be carried in the November issue of the AMERICAN ENGINEER.

Connecticut

The Connecticut Society reports that membership is increasing steadily throughout the state and that a Hartford County chapter is to be formally organized in September due to the untiring efforts of George Mylchreest and his assistants.

The Society held its annual outdoors summer meeting July 19 at Hill's Acre, county residence of Frederick M. Hill, Past President of the New Haven Chapter.

Coming Events To Remember

National Meetings

December 4, 5 and 6. NSPE Annual Convention, Statler Hotel, Buffalo, N. Y.

Indiana

The Indiana Society reports that first registration examinations for 1947 graduates were held just prior to the end of the last school year. A total of 301 students applied to take the examinations.

Massachusetts

The Metropolitan (Boston) Chapter of the Massachusetts Society has scheduled the first meeting of the fall calendar for Wednesday evening, October 29 at the Boston City Club. Mr. Paul H. Robbins, NSPE Executive Director is scheduled as the principal speaker.

Michigan

The Board of Directors of the Michigan Society of Professional Engineers reports the formation of a new chapter in the industrial city of Jackson. Mr. Emmet H. Greenwood, 133 N. Wisner Street of Jackson, who has been a member of the Lansing Chapter, was instrumental in bringing the group together.

An informal meeting was held on June 16, with invitations going to approximately 125 local professional engineers. Those present displayed interest in forming a chapter and on June 30, President Szabo and other State Officers attended a meeting in Jackson to answer questions and outline the activities of NSPE, the Michigan Society, and local chapters.

On June 23, the State Board of Directors approved the application of the Jackson group for a charter—the fourth granted in Michigan.

The Michigan Board also reports that it expects to charter more chapters in the near future. A meeting was held on August 25 to consider the formation of a Washtenaw County group.

* * *

It is with regret that we report the death last month of Professor Henry H. Higbie, 64, a member of the teaching staff of the University of Michigan's engineering school and a charter member of the Michigan State Society.

Professor Higbie was well known in the profession as an outstanding electrical engineer, in addition to be-

ing an educator. Many members of the Michigan Society have been his students and his activity in connection with the advancement of the electrical engineers work in the State has made him one of the most prominent leaders in this field in the country.

New Jersey

At the regular NJSPE Trustees' meeting held in Trenton on June 20, President Jones appointed Engr. Richard L. Higgins chairman of the special committee to meet with the representatives of the architectural profession in New Jersey. The overall purpose of the joint meeting will be to discuss amicably existing laws as they affect both professions . . . and where necessary, to initiate remedial measures that will mutually benefit the two groups.

* * *

Existing laws in New Jersey, as they pertain to the filing of plans and specifications with officials of the state agency in charge do not recognize the seal of a Professional Engineer when the submitted plans are for construction or alteration of New Jersey school buildings. An NJSPE member has for some time endeavored to have such plans accepted because the work involved was basically engineering work. The New Jersey Society Headquarters made frequent contacts with responsible officials and was instrumental in securing an opinion from the Attorney General. The net result is that the particular engineer's plans have been ordered accepted and approved, on the basis that they covered engineering work.

* * *

NJSPE will hold its 1947 semi-annual meeting at the Hotel Hildebrecht, Trenton, on September 20. It is probable that the annual regional conference, generally sponsored by the Pennsylvania Society, will be part of the semi-annual program. When definite plans have been made, neighboring State Societies will be immediately informed and invited to attend.

* * *

New Jersey is extremely proud of one of its members—Amos F. Dixon, Assemblyman from Sussex County, 1st Vice-President of the State Constitutional Convention now convening at New Brunswick, New Jersey, and co-inventor of the dial telephone and electric teletype. Recently Engineer Dixon was honored by the American Institute of Electrical Engineers with a life membership in the grade of Fellow, highest in the Institute.

* * *

The New Jersey Engineer publishes a regular column entitled Positions Available and Positions Wanted. Within one week of the mailig of the July issue, a half dozen responses from applicants and potential employers were received. The importance of utilizing State Society journals and Headquarters as such clearing houses, cannot be overemphasized.

New York

The Editors of the New York PE News have received informal advice from attorneys of the Internal Revenue Department that dues paid for the three levels of membership (chapter, state and national) in the professional society are deductible from income tax under provisions of Section 23 of the Internal Revenue Code. No formal ruling ever has been made to the knowledge of attorneys consulted but the situation is considered analogous to membership in Bar Associations or the A. M. A. and unofficial assurance was given that dues paid to the professional engineering societies could be deducted. If you haven't been taking advantage of Section 23 of the Internal Revenue Act insofar as dues to NYSSPE (and NSPE) are concerned, be sure to do so when filing your next returns.

* * *

Reprinting of the NYSSPE's pamphlet on fees and salaries was authorized by the Executive Committee at its meeting on July 25. The new edition revises previous salary figures upward by 37½ percent, and includes Westchester County in the Metropolitan district where an additional 10 percent is justified.

Vice-President George J. Nicastro revealed that New York County Chapter has set up a plan for distribution of the pamphlets to prominent users of engineering services in its area. It was highly recommended that other chapters follow the same idea for distribution and request bulk lots of the pamphlet from Headquarters.

It should be borne in mind that printing costs approximate ten cents per copy and, for that reason, every effort should be made to place them in the hands of persons who can give most help toward realization of the objectives indicated. For the purposes of members, it is believed tha a considerable stock of the previou edition may be utilized.

* * *

Vice-President William W. Perr (Broome Area), Chairman of th Educational Program Committee an a member of the NYSSPE Execu tive Committee, gave an extensiv report on his committee's past a tivities at the Executive Committee last meeting. The successful mee ings at Cornell and Syracuse Un versities during the last school perio were analyzed and provided basis f plans to carry the message of "pr fessionalism" to all technical schoo and colleges in the state during t coming school year. Mr. Perry stat that the plans now being formulat will be put into action about the mi dle of the coming October.

Ohio

The Dayton Chapter reports:

Due primarily to the efforts of B Hommel, Chairman of our Educati Committee, the refresher course he in cooperation with the University Dayton last spring was an outstan ing success. We have had many r quests for another similar cour from men who were not able to pa ticipate in the one last spring. A cordingly, a course has been arrang with the University of Dayton start approximately Oct. 15th. Cl ses will be held on Monday, Wedn day, and Friday evenings, and ea class will run for two hours. T course will last approximately weeks and the fee will be $15. The class will be limited to a ma mum of 40.

We wish to publically thank B Holien and his staff at the Univers

MEN WANTED

State Highway Commission of Wisconsin

Permanent Vacancies Milwaukee & Other Areas

★

Sr. Engr. Aid (Instrument Man)	$1
Surveyor	18
Engineer I (Grad. Civil or Equiv.)	22
Engineer II (Grad. Civil or Equiv. & Hwy. Exp.)	26

Field Expenses & Sick Leave
Vacations & Retirement Plan

★

WRITE—BUREAU OF PERSONNE
State Capital, Madison, for appli tion blanks and further informati

Dayton for their excellent co-ration in the course held last ing and for their interest in con-uing such an activity. Forty-two n enrolled in the previous course l received a general review in thematics up to calculus followed general chemistry, general mech-cal engineering, electrical engi-ring, physics and mechanics. Spe-l review in advanced phases of chanical and electrical engineering s given in separate groups. The ıl lecture covering ethical and pro-sional aspects of engineering was ably given by a fellow member, L. Luaces.

* * *

The Dayton Chapter of OSPE has n incorporated under the laws of io as a non-profit corporation.

* * *

The Cincinnati Chapter of OSPE s just innaugurated its new offi-s: James S. Lineback, president; ank H. Woods, vice-president; onard A. Bauer, 2nd vice-presi-nt; Alfred C. LeFeber, secretary; l Harry J. Long, treasurer.

The new officers are looking for-rd to a big year. Cincinnati will y host to about 1000 members of Ohio Society at the State Con-ntion in March, 1948.

* * *

The Toledo Chapter has ques-ned the engineers of the local area to (1) how many not now regis-ed desire to become registered en-neers and (2) how many would be erested in taking a refresher urse to prepare for the State Board amination.

While figures on the returns are t as yet available, word from offi-ls of the chapter is that the re-onse has been gratifying.

* * *

The Ohio Society reports an an-uncement by the Board of Regi-ation of Professional Engineers l Surveyors that 502 candidates k the examination on July 18 and Of these, 188 were taking the gineer-in-training examination.

Second stage examinations for En-eers and Surveyors will begin netime this Fall. Only those hold-engineer-in-training certificates l be eligible.

Presentation of Certificates will e place the third week in Novem-.

The next Ohio examination for ofessional Engineers and Survey-will be held in Columbus, Janu-2 and 3, 1948.

* * *

The Zanesville Regional Society of Engineers and surveyors (OSPE) recently started a new publication, "The Theodolite."

While only a few issues have been released to date, it can already be seen that the Zanesville chapter knows how to make the best of an opportunity.

The publication is mimeographed and bound in an attractive cover which has the appearance of blueprint paper. The cover drawing shows a map of Ohio with the regions covered by the chapter indicated in outline. The general format and style makes for an excellent publication.

Oklahoma

The June 11th summer meeting of District 10, Oklahoma Society of Professional Engineers, was devoted to an analysis of the State Society and professionalism.

It was a closed session, with only members present. Twenty-four percent of the membership attended and a large portion of those took an active part in the discussion. Everyone present showed a keen interest in the formulation of a definite policy that will not only unite the engineering fraternity but dedicate such unification to the betterment of the public service.

Considerable discussion centered around (1) the engineer-in-training, (2) an additional affiliation of associates, and (3) consolidation of the OSPE and state registration offices. It is expected that further consideration will be given to these matters at future meetings, and that specific recommendations will be made in the near future.

It was also pointed out that NSPE is the important goal and that consolidation of the various state societies into sections of a national society has many advantages.

The district and state offices now feel that more meetings of this type must be held, that specific phases of professional activity must be discussed, and that the first task that must be accomplished is to make both the engineer and the general public conscious of the importance of professionalism in engineering, who the professionals are, what professionalism is, where it can best function, when it should be applied and why it is demanded.

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What's New For Engineers

Requests for further information concerning any item mentioned under this heading will be promptly referred to the manufacturer. It would be appreciated if inquiries be addressed on professional or company letterhead.

Send Inquiries Direct to American Engineer,
1359 Connecticut Ave., Washington, D. C.

NEW LIQUID COMPOSITION*

This manufacturer has perfected four grades of a new liquid tripoli composition identified as Acme No. 2-L-70, 2-L-75, 2-L-77, and 2-L-79. The company has also entered into an agreement with another firm for the distribution of their equipment for the application of these liquid tripoli compositions, and is therefore prepared to supply complete installation and service. Characteristics of the new polishing compositions are given below: 2-L-70, double duty with superior color; 2-L-75, medium cut with good color; 2-L-77, good cutting with medium color; 2-L-79, heavy cut with medium color. These compounds have been tested in production for a number of months and each grade has demonstrated marked efficiency. These compounds can be used with any approved type of spray equipment. The pressure method of feeding liquid tripoli to the wheel is preferred over the gravity feed. Where liquid compositions can be suitably applied, the apparent advantages over bar type are: 1. large savings in amount of compositions used, 2. considerable savings in buffs, 3. higher color per degree of cut, 4. ease of application.

For further information address American Engineer, reference No. 900.

PATCH TYPE GLOVES*

This rubber manufacturer has introduced a glove designed to solve the hand protection problem in industries where both adequate protection and sure-gripping are required in a glove. This patch type glove is rugged enough to insure safety, and the corrugated patches on palm, thumb and fingers provide positive gripping action in kep spots. The patches extend over the end of the fingers, to guard fully against slippage and to provide double thickness at points of greatest stress. Made of same material as the glove, the patches are uncured when first attached and cured along with the glove itself to insure permanent adhesion. This glove is available in sizes 10 and 11; the color is black.

For further information address American Engineer, reference No. 901.

PORTABLE TOGGLE CLAMP*

A manufacturer of production clamping tools is now manufacturing a new portable toggle clamp app cable to a variety of processes. Th plier clamp was designed for she metal work, plastic sheet cementi or laminating, and other operatio necessitating quick, postiive pressu on relatively light gauge materials u to 3/8-inch thickness. Toggle lock a tion holds parts in position for dri ing, riveting, welding, gluing on su products as sheet metal ducts, hou ings, cabinets of wood, plastic, a metal, auto bodies and aircraft a semblies. It is especially suitable f template locating, as it is adjustab for efficient pressures on vario thicknesses, and provides a firm ha grip for opening and closing. No is narrow for use in restricted space Entire tool is forged and may be r vamped for special application welding, grinding, etc. To minimi wear, replaceable hardened ste bushings are used throughout.

For further information address Ame ican Engineer, reference 902.

NEW 1-H.P. MOTOR CONTROLS

These new 1-h.p. controllers d signed for medium industrial or wo shop equipment are available in fo switching arrangements: reversin two-speed, series-parallel and 3-po off-on. This recently announc series has plastic case, handle a contact rotor. An outstanding fe ture is its versatility of mountin Several mounting arrangements a available such as an angle brack flange mounting plates and plates f attachment to several styles of stan ard outlet boxes. Rated: 1 H. single and 3 phase 110 to 550 v. A. 1/4 H.P. 115 to 230 v. D.C. Non i ductive loads: 10 amps 110 v. A.C 5 amps, 220 v. A.C. Manufactur will supply full application data.

For further information address Ame ican Engineer, reference No. 903.

NEW 1-H.P. AC MOTOR*

This manufacturer of rotary ele trical equipment announces, after two year field test and pilot produ tion experience, a 1-h.p. AC moto which is now in full production. starting torque is three times as gre as the full load torque to overco dead load. In addition, power eq to twice the full load torque is i stantaneously available to take ca of momentary overloads. Cool ope ation is obtained by fan ventilati and efficient heat dissipation. So noteworthy features include: dri proof, grease-proof protective armo shaft opening covers to exclude fo eign matter; quick change clock counterclock rotation; 115 or 2 volts A.C. by simple connecti

* Items so marked are furnished by the editorial staff of the magazine *Production Equipment.*

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ges; single or polyphase types. available in ½ and ¾ h.p.

r further information address Amer- Engineer, reference No. 904.

NEW PALM DRILL

new ¼-inch palm drill has been ed to the line of portable drills ufactured by this company. This pact and powerful drill has been gned to meet the need for a com- ely one-hand operated drill, and ures a hand-fitted pistol grip. In- orated in the grip is a special ger switch for intermittent use ch can be locked for continuous ration or released with one finger he gripping hand. All bearings ball bearings, with heat treated me molly steel helical gears are l throughout. Equipment con- of a 3-jaw chuck with key and nted key holder, plus 15 feet of e conductor, rubber covered cable plug. Key cannot be misplaced is permanently attached to cable. l capacity is ¼-inch steel and nch hard wood. A powerful 110 A.C.-D.C. motor drives the drill 1100 r.p.m. with full load, and 0 r.p.m with no load. Motors in r speeds and voltages can be plied to fit the need.

r further information address Amer- Engineer, reference No. 905.

NDUSTRIAL HAND CLAMP*

clamp that possesses a distinctive and swivel arrangement that nits angular clamping within 180° been announced. This feature inates the necessity for shim- g the base. Known as the S-1100 base, with its integral front cket and back support, can be ed with the mounting-side posi- ed vertically, either front or back, the face of base toward spindle, t any intermittent angle. Mounted the face of base toward spindle ection at the latter is only 3/16- ; mounted on opposite side, with of base farthest from spindle, deflection is less than 7/32-inch. measures 16¼-inch in height and inches in overall length; and ghs 7¼ pounds. A man's nor- hand operation can exert a pres- of 1350 lbs. at the extreme end ar. Work is automatically locked he characteristic toggle action of clamp. The unique spindle as- bly can be moved longitudinally g toggle bar, thus permitting wide ge of adjustments. This assembly be removed and replaced by any ial pad of your own specifica- s to meet your particular needs.

r further information address Amer- Engineer, reference No. 906.

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PORTABLE POLISHER*

A new lightweight portable electric polisher and sander with a 5-inch disc has been announced. This new portable tool is light enough for one-hand operation, weighing only four pounds, yet powerful enough to perform all types of sanding, polishing, buffing and other rotary operations on a five-inch disc. It is designed for use on small jobs or intermittent use. A trigger switch and pistol handle make it easy to operate and control the machine with one hand. A hand fitting knob is strategically placed for easy gripping when two hand operation is desired. The spindle turns at 5,000 r.p.m. idle speed which gives a normal load speed 3,000 r.p.m. The motor is 115 volt, A.C.-D.C. A 3-inch disc is also available together with 3-inch sandpaper discs and a 5-inch lamb's wool polishing pad. The new polisher and sander has hundreds of industrial applications including sanding all types of woodwork, sanding metal, polishing and buffing and many other hand operations. It will save time, improve quality and reduce costs in the metal-working industries, in the building trades, in schools, in plastics, in boat building and in any other industry where a high speed rotary tool can improve on hand operations.

For further information address American Engineer, reference No. 907.

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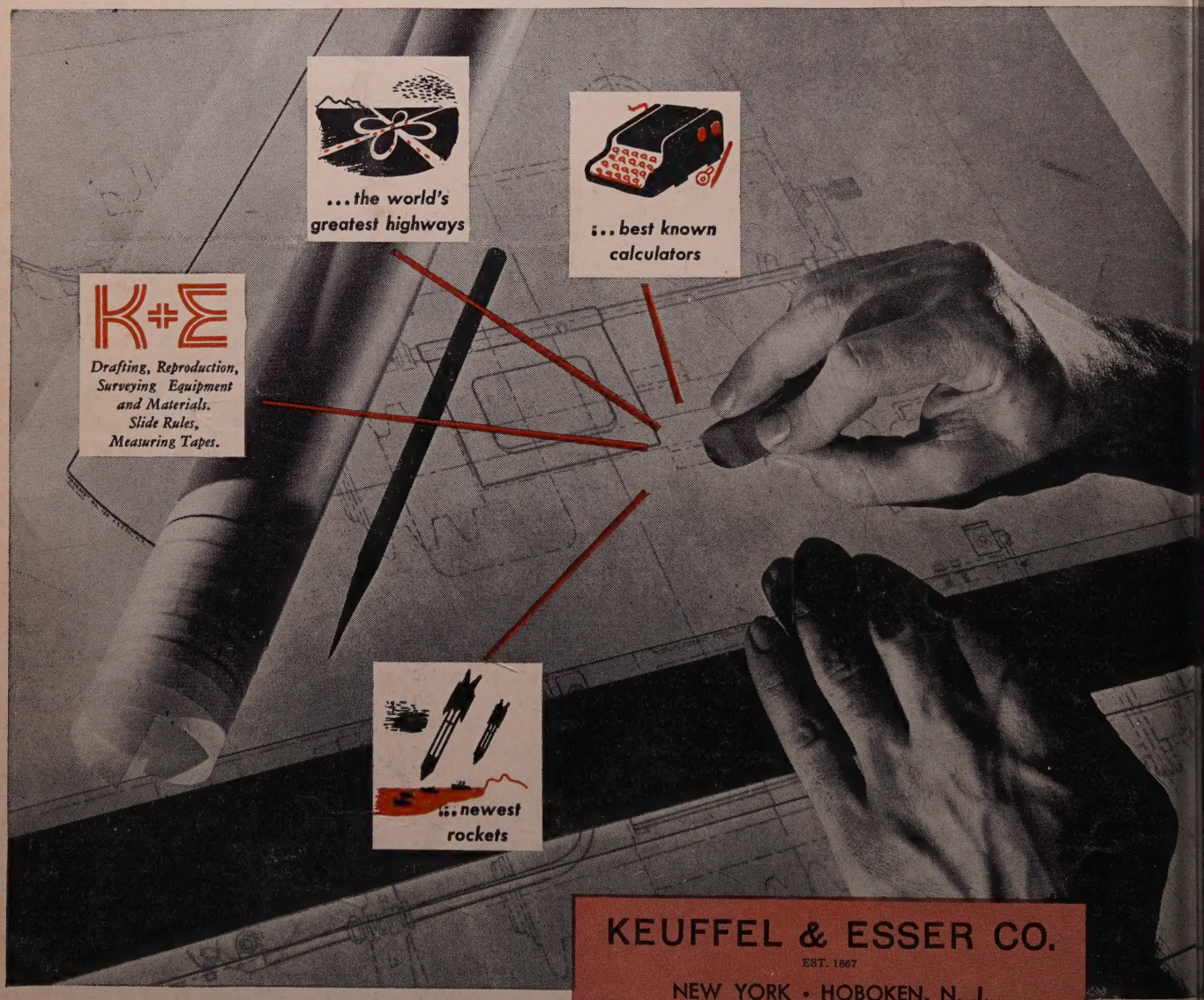
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